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HOW WE BUILT THE UNION PACIFIC RAILWAY

And Other Railway Papers and Addresses

BY

Major-General GRENVILLE M. DODGE
Chief Engineer Union Pacific Railway
1866-1870

PRESENTED BY MR. HALE

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CONTENTS.

Page.
How we built the Union Pacific Railway 5
Address at the Omaha Centennial 41
The Building of the Union Pacific Railroad and Its Relation to Council Bluffs and Western Iowa 47
Fortieth Anniversary of Driving of the Last Spike 55
What I Know of Harriman 61
A Tribute to General Dodge 65
Speech of G. M. Dodge in Congress, March 25, 1868, on the Union Pacific Railroad 69
The Civil Engineer in an Early Day and in the Civil War 77
Address at Banquet of Commercial Club, Omaha 101
Address at unveiling of monument to Marshall F. Hurd 107
Address on "The Pioneers and Development of the West" 113
Letter to the Iowa Railway Club 119
Description of Norwich University 123
Norwich University in the Civil War 125
Address Before the Vermont Society of New York 131

ILLUSTRATIONS.

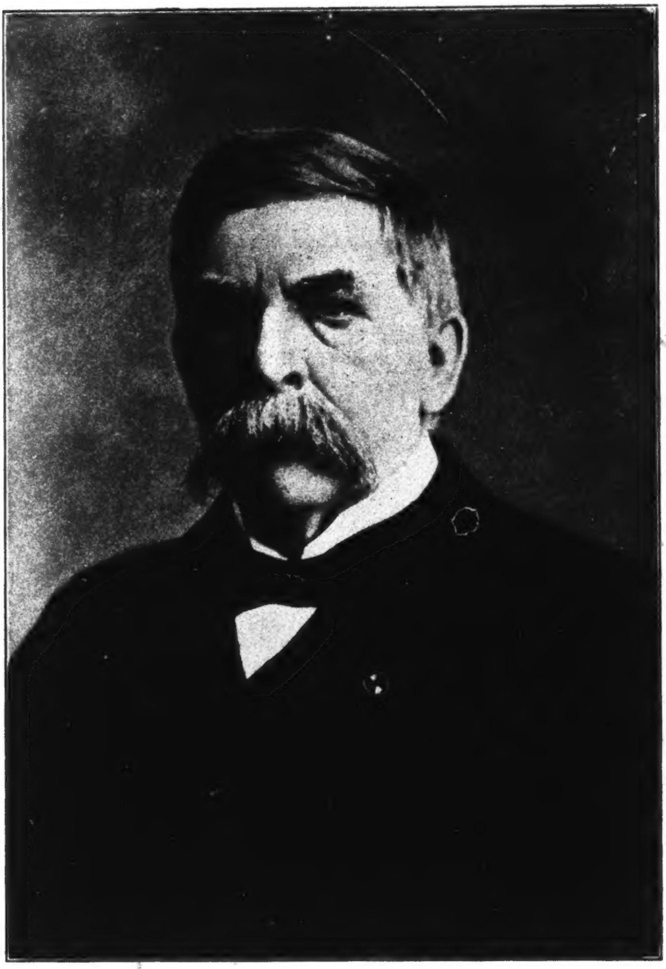
Faces page.

Major-General G. M. Dodge.......... 5
Dale Creek Bridge.......... 14
General Dodge and Party of Exploration.......... 20
General Grant and Party Visit General Dodge.......... 25
Temporary Trestle, Promontory, Utah.......... 27
S. B. Reed.......... 30
General J. S. Casement.......... 31
Six Passenger Trains Snowed In.......... 38
City of Rocks.......... 41
Twin Monks.......... 47
Joining of Tracks.......... 55
The Locomotives Touched Noses.......... 57
Cedar Pass, Utah.......... 58
Monument Point, Great Salt Lake.......... 61
Eagle Nest, Utah.......... 65
Laramie Peak, Wyoming.......... 67
Laramie River Canyon, Wyoming.......... 69
Thos. B. Morris and Party.......... 77
Tunnel No. 3, Weber Canyon.......... 82
Divide of the Continent.......... 89
Camp on Snake River Range.......... 90
Humboldt Wells.......... 96
Chief Engineer's Office, Omaha, 1866-1870.......... 101
Entrance to North Platte Canyon.......... 107
Thousand Mile Tree, Weber Canyon, Utah.......... 109
Julesburg Stage Station, Wyoming, 1867.......... 113
Union Pacific Railway Crossing, Green River, Utah.......... 119
General Dodge's Camp, Blackfoot Creek, Utah.......... 123
Bear River Bridge, Utah.......... 125
Cottonwood Grove, Weber Canyon, Utah.......... 131

pliments of

Mr. John Boyd.

1417 Rhode Island Avenue.



MAJOR-GENERAL G. M. DODGE.

Chief Engineer, Union Pacific Railway, 1866-1870.

HOW WE BUILT THE UNION PACIFIC RAILWAY.

In 1836 the first public meeting to consider the project of a Pacific railway was called by John Plumbe, a civil engineer of Dubuque, Iowa. Interest in a Pacific railway increased from this time. The explorations of Fremont in 1842 and 1846 brought the attention of Congress, and A. C. Whitney was zealous and efficient in the cause from 1840 to 1850. The first practical measure was Senator Salmon P. Chase's bill, making an appropriation for the explorations of different routes for a Pacific railway in 1853. Numerous bills were introduced in Congress between 1852 and 1860, granting subsidies and lands, and some of them appropriating as large a sum as $96,000,000 for the construction of the road. One of these bills passed one of the houses of Congress. The results of the explorations ordered by Congress were printed in eleven large volumes, covering the country between the parallels of latitude thirty-second on the south and forty-ninth on the north, and demonstrating the feasibility of building a Pacific railway, but at a cost on any one of the lines much larger than the Union Pacific and Central Pacific were built for. It is a singular fact that in all these explorations the most feasible line in an engineering and commercial point of view, the line with the least obstacles to overcome, of lowest grades and least curvature, was never explored and reported on. Private enterprise explored and developed that line along the forty-second parallel of latitude.

This route was made by the buffalo, next used by the Indians, then by the fur traders, next by the Mormons, and then by the overland immigration to California and Oregon. It was known as the Great Platte Valley Route. On this trail, or close to it, was built the Union and Central Pacific railroads to California, and the Oregon Short Line branch of the Union Pacific to Oregon.

In 1852 the Mississippi and Missouri Railroad Company was organized to build a line westward across the State of Iowa as an extension of the Chicago and Rock Island, then terminating at Rock Island, Ill. The principal men connected with this line were Henry Farnum and Thomas C. Durant. Peter A. Dey, who had been a division engineer of the Rock Island, was the chief engineer of the M. & M. in Iowa. He was a man of great ability, probity, and integrity.

In May, 1853, Mr. Peter A. Dey left the Rock Island, of which he was a division engineer, stationed at Tiskilwa, and commenced at Davenport, Iowa, the first survey of a railroad line across the State of Iowa. I had been with Mr. Dey about eight months as rodman, and under his direction had made a survey of the Peoria and Bureau Valley Railway in Illinois. Mr. Dey was made chief engineer of the M. & M., and took me to Iowa as assistant, and placed me in charge of the party in the field, certainly a very fine promotion for the limited experience I had, and it is one of the greatest satisfactions and pleasures of my life to have had his friendship from the time I entered his service until now. Mr. Dey is not only a very distinguished citizen of Iowa, but is one of the most eminent engineers of the country. He was known for his great ability, his uprightness, and the square deal he gave every one, and he has greatly honored his State in the many public positions he has held. I look back upon my services with him with the greatest pleasure. He has a wide reputation as a civil engineer and railway constructor, and in later years as railway commissioner for the State of Iowa.

In 1853 he gave the orders for the party that surveyed the first line across Iowa to examine the country west of the Missouri River. This was to determine where the M. & M. (now the Rock Island) line crossing Iowa should terminate on the Missouri River, in order to take advantage of, and, perhaps, become a part of the prospective line running west up the Great Platte Valley, then the chief thoroughfare for all the Mormon, California, and Oregon overland immigration. It fell to my lot to be chief of this party. My examinations virtually determined that a railway line extending west from the Missouri River should go by way of Sarpys Point (now Bellevue), or directly west from Kanesville, afterwards Council Bluffs, where the Mormons from Nauvoo were then resting on their way to Salt Lake.

My party crossed the Missouri River in the fall of 1853 on flatboats. The Omaha Indians occupied the country where we landed, and after obtaining a line rising from the bluffs west of where the city of Omaha now stands, I gave directions to the party to continue the survey while I went on ahead to examine the country to the Platte Valley some 25 miles farther west. I reached the Platte Valley about noon the next day, and being very tired, I lariated my horse and laid down with my saddle as a pillow and with my rifle under it, and went sound asleep. I was awakened by the neighing of the horse, and when I looked up I saw an Indian leading the horse toward the Elkhorn River, pulling with all his might and the horse holding back, evidently frightened. I was greatly frightened myself, hardly knowing what to do, but I suppose from instinct I grabbed my rifle and started after the Indian, hollering at the top of my voice. The Indian saw me coming, let the horse go, and made his way across the Elkhorn River. This Indian afterwards was an enlisted man in the battalion of Pawnees that served under me in the Indian campaigns of 1865, and he told Major North, the commander of that battalion, that he let loose of the horse because I hollered so loud that it frightened him. On obtaining my horse, I saddled up and made my way back to the party that was camped on the Big Papillion on the emigrant road leading from Florence to the Elkhorn. The camp was full of Omaha Indians and they had every man in the party cooking for them. I saw that we would soon lose all our provisions, and as the party was armed, I called them together and told them to get their arms. I only knew one Indian word, "Puckechee," which meant get out. That I told them, and while the Indians were surly they saw we were determined and they left us. I don't believe there was anyone in the party that had ever seen an Indian before or had any experience with them. We were all tenderfeet. It taught me a lesson, never to allow an Indian in my camp or around it without permission, and this was my instructions to all our engineering parties. Those who obeyed it generally got through without losing their stock or lives. Those who were careless and disobeyed generally lost their stock and some of their men. As soon as we had determined the line from the Missouri River to the Platte we returned to Iowa City, which was the headquarters of the M. & M. Railway.

The times were such that the work on the M. & M. Railway was suspended for some years. Meanwhile I located at Council Bluffs, continuing the explorations under the direction of Messrs. Farnam and Durant, and obtaining from voyagers, immigrants, and others all the information I could in regard to the country farther west. There was keen competition at that time for the control of the vast immigration crossing the plains, and Kansas City, Fort Leavenworth (then the government post), St. Joseph, and Council Bluffs were points of concentration on the Missouri. The trails from all the points converged in the Platte Valley at or near old Fort Kearney, following its waters to the South Pass. A portion of the Kansas City immigration followed the valley of the Arkansas west, and thence through New Mexico. The great bulk of the immigration was finally concentrated at Council Bluffs as the best crossing of the Missouri River. From my explorations and the information I had obtained with the aid of the Mormons and others, I mapped and made an itinerary of a line from Council Bluffs through to Utah, California, and Oregon, giving the camping places for each night, and showing where wood, water, and fords of streams could be found. Distributed broadcast by the local interests of this route this map and itinerary had no small influence in turning the mass of overland immigration to Council Bluffs, where it crossed the Missouri and took the great Platte Valley route. This route was up that valley to its forks, and then up either the north or south fork to Salt Lake and California by way of the Humboldt, and to Oregon by way of the Snake and Columbia rivers. This is to-day the route of the Union and Central Pacifics to California and the Union Pacific to Oregon.

After collecting all the information we could as to the best route for a railroad to the Pacific, I reported to Messrs. Farnam and Durant, who paid out of their private funds for all my work. In 1857 or 1858 they asked me to visit New York. In the office of the Rock Island Railroad, over the Corn Exchange Bank in William street, I was brought before the board of directors of that road and the Mississippi and Missouri Railway, together with some friends who had been called in. The secretary of the company read my report. Before he was half through nearly every person had left the room, and when he had finished only Mr. Farnam, Mr. Durant, the reader, and myself were present. I could see that there was lack of faith and even interest in the matter. One of the directors said in the outer room that he did not see why they should be asked to hear such nonsense, but Messrs. Farnam and Durant did not lose faith. Since our survey in 1853, other companies had made surveys in Iowa, all concentrating at Council Bluffs. Farnam and Durant felt that if they could stimulate interest in the Pacific road it would enable them to raise funds to complete their line across the State, and authority was conferred upon me to begin work at Council Bluffs and build east through Pottawattamie County, if I could obtain local aid. This we secured, and the road was graded through that county, when we were called east to continue the work from Iowa City west.

In 1854, when Nebraska was organized, we moved to its frontier, continuing the explorations under the patronage of Messrs. Farnam and Durant, and obtaining all valuable information, which was used to concentrate the influence of the different railways east and west of Chicago to the support of the forty-second parallel line.

In 1861 we discontinued the railroad work because of the civil war. The passage of the bill of 1862, which made the building of a transcontinental railroad possible, was due primarily to the persistent efforts of Hon. Samuel R. Curtis, a Representative in Congress from Iowa, who reported the bill before entering the Union service in 1861. It was then taken up by Hon. James Harlan, of Iowa, who succeeded in obtaining its passage in March, 1862.

Up to 1858 all the projects for building a railroad across the continent were regarded as the Pacific roads, each route mentioned having a particular name. The line along the forty-second parallel of latitude was designated as a line from San Francisco to a point on the Missouri River not farther north than Council Bluffs and not farther south than Independence, Mo., and was called the Pacific Railroad. The line surveyed by Stephens along the forty-ninth parallel of latitude was called the North Route. The route along the thirty-eighth and thirty-ninth parallels, as the Buffalo Trail. It received that name from Thomas H. Benton. The route along the thirty-fifth and thirty-second parallels, as the South Route. The Government, however, made no explorations along the forty-second parallel; that was done by individual enterprise. In 1856 both political parties in convention passed resolutions favoring a Pacific railroad, and in 1857 President Buchanan advocated it as a reason for holding the Pacific coast people in the Union, and it was this sentiment that gave to the forty-second parallel line the name of the Union Pacific Railroad. In 1858 a select committee of fifteen was authorized by Congress on Pacific railroads and in the Thirty-fifth Congress, second session, this committee allowed the Hon. Samuel R. Curtis, of Iowa, to report the bill, and if I recollect rightly, this was the first bill that took the name of Union Pacific. In the Thirty-sixth Congress General Curtis became the champion of the Union Pacific Railroad, and it was advocated then as a strong element in holding the Union together. Curtis's bill passed the House in December, 1860. It failed to become a law, as the question of secession was up then and Lincoln had been elected President. In the extra session of the Thirty-second Congress in July, 1861, Curtis reintroduced the bill and he left Congress to enter the army. When Representative Campbell, of Pennsylvania, became chairman of the committee, Senator Harlan, of Iowa, who had been elected to the Senate, became the strongest advocate of the bill in the Senate. Lincoln advocated its passage and building, not only as a military necessity, but as a means of holding the Pacific coast to the Union. This bill became a law in 1862, and there is no doubt but what the sentiment that the building of the railroad would hold the Union together gave it the name of the Union Pacific.

The Union Pacific Railway was organized on September 2, 1862, at Chicago, Maj. Gen. S. R. Curtis, of Iowa, being chairman of the commissioners appointed by Congress. The organization was perfected by making Henry B. Ogden, of Chicago, president; Thomas W. Olcott, treasurer, and Henry V. Poor, secretary. Mr. T. C. Durant selected Peter A. Dey to make a reconnoissance from the Missouri River to Salt Lake to be reported at the next meeting of the board. Mr. Dey immediately entered upon his work and extended his reconnoissance through to Salt Lake Valley.

In the spring of 1863, when in command of the district of Corinth, Miss., I received a dispatch from General Grant to proceed to Washington and report to President Lincoln. No explanation coming with the dispatch, and having a short time before organized and armed some negroes for the purpose of guarding a contraband camp which we had at Corinth, which act had been greatly criticised in the army and by civilians, I was somewhat alarmed, thinking possibly I was to be called to account. But on arriving at Washington I discovered that my summons was due to an interview between Mr. Lincoln and myself at Council Bluffs in August, 1859. He was there to look after an interest in the Riddle tract he had bought of Mr. N. B. Judd, of Chicago. I had just arrived from an exploring trip to the westward. It was quite an event for an exploring party to reach the States, and after dinner, while I was resting on the stoop of the Pacific House, Mr. Lincoln sat down beside me, and by his kindly ways soon drew from me all I knew of the country west, and the results of my reconnaissances. As the saying is, he completely "shelled my woods," getting all the secrets that were later to go to my employers.

Under the law of 1862 the President was to fix the eastern terminus of the Union Pacific Railway, and, remembering our talk in the fifties, he wished to consult me in the matter. Several towns on the Missouri River were competing for the terminus, but Mr. Lincoln practically settled the question in favor of the location I recommended. He issued his first order on November 17, 1863. It was in his own language, and as follows:

> I, Abraham Lincoln, President of the United States, do hereby fix so much of the western boundary of the State of Iowa as lies between the north and south boundaries of the United States township within which the city of Omaha is situated as the point from which the line of railroad and telegraph in that section mentioned shall be constructed.

This order was not considered definite enough by the company, and on March 7, 1864, President Lincoln issued the second executive order, as follows:

> I, Abraham Lincoln, President of the United States, do, upon the application of said company, designate and establish such first-named point on the eastern boundary of the State of Iowa east of and opposite to the east line of section 10, in township 15 south, of range 13 east, of the sixth principal meridian in the Territory of Nebraska.

On March 8, 1864, he notified the United States Senate that on the 17th day of November, 1863, he had located the "eastern terminus of the Union Pacific Railway within the limits of the township in Iowa opposite to the town of Omaha." Since then, he says, the company has represented to me that upon additional survey made it has determined upon the precise point of departure of the branch road from the Missouri River, and located same within the limits designated in the order of November last.

He was very anxious that the road should be built and discussed that question with me.

I explained to him as clearly as I could how difficult it would be to build it by private enterprise, and said I thought it should be taken up and built by the Government. He objected to this, saying the Government would give the project all possible aid and support, but could not build the road; that it had all it could possibly handle in the conflict now going on. But the Government would make any change in the law or give any reasonable aid to insure the building of the road by private enterprise.

After my interview with the President, I proceeded to New York and met Mr. T. C. Durant, then practically at the head of the Union Pacific interests, and other interested persons. After I had presented the President's views they took new courage, and at the yearly meeting of the company, Gen. John A. Dix was made president, Thomas C. Durant, vice-president, H. V. Poor, secretary, and J. J. Cisco, treasurer. They then submitted to Congress the necessary changes needed in the law of 1862, in order to bring the capital of the country to their support.

In the fall of 1863 Mr. Durant had personally instructed Mr. Dey to organize parties for immediate surveys to determine the line from the Missouri River up the Platte Valley, to run a line over the first range of mountains, known as the Black Hills, and to examine the Wasatch Range. In his report Mr. Durant said:

> It is here that the information derived from the examinations made by Gen. G. M. Dodge, and those made last year by Peter A. Dey, who was sent out by the committee appointed by your board of commissioners, proved of great value, as the present parties will avail themselves of the examinations made by these gentlemen, and will first run the lines which they found most practicable.

In accordance with these instructions, Mr. Dey placed B. B. Brayton in charge of the party examining the Black Hills, and, at Mr. Dey's request, Brigham Young placed his son, James A. Young, in charge of the surveys over the Wasatch. Mr. Dey, who had become chief engineer, placed engineering parties in the field covering the territory from the Missouri River to Salt Lake.

Ground was broken at Omaha for the beginning of the road on the 1st day of December, 1863, and after the passage of the act of 1864 about $500,000 was spent in grading and surveys.

A question as to the location brought a disturbing contest between Omaha and the company. Mr. Dey had located the line due west to the Elkhorn River. The consulting engineer, Colonel Seymour, recommended a change, increasing the distance 9 or more miles in 13, The main argument for adding 9 miles of distance in 13 miles of road was that it eliminated the 80 and 66 foot grades of the direct line. If this had been done there would have been some argument for the change, but they only eliminated the grades from the Omaha summit west, while it took 3 miles of 60 and 66-foot grade from the Missouri River to reach this summit, and coming east the Elkhorn summit was an 80-foot grade, so by the change and addition of 9 miles they made no reductions in the original maximum grades, or in the tonnage hauled in a train on the new lines over the old line, if it had been built. The grades at Omaha and Elkhorn have been eliminated since 1900, and the new management are adopting the old Dey line for the distance it saves, and bringing the grade to the road's maximum of 47 feet to the mile. It was Mr. Dey's intention that when traffic demanded the original short line grades would be reduced to whatever maximum grade the road should finally adopt. After a long contest and many reports the Government provided that the change should only be made if the Omaha and Elkhorn grades were eliminated, the first by a line running south from Omaha 2 miles down the Missouri Valley and cutting through the bluffs to Muddy Creek, giving a 35-foot maximum grade, and the Elkhorn by additional cutting and filling without changing the line, but this was never done. The company paid no attention to the decision, but built on the changed line, letting the grades at Omaha and Elkhorn stand, and the government commissioners accepted the road, ignoring the Government's conditions for the change, and bonds were issued upon it, although it was a direct violation of the government order. The final decision in favor of the change and the ignoring of Mr. Dey's recommendations in letting the construction contracts caused Mr. Dey, in January, 1865, to send in his resignation. He stated in his letter of resignation that he was giving up "the best position in his profession this country has offered to any man."

The officers of the Union Pacific then requested me to return and take charge of the work. I was then in command of the United States forces on the plains in the Indian campaigns, and General Grant was not willing that I should leave, so I finished my work there and went to Omaha on the 1st of May, 1866, and assumed the duties of chief engineer, having been allowed leave of absence through the following letter of General Sherman:

HEADQUARTERS MILITARY DIVISION OF THE MISSISSIPPI,
St. Louis, May 1, 1866.

Major-General DODGE.

DEAR GENERAL: I have your letter of April 27, and I readily consent to what you ask. I think General Pope should be at Leavenworth before you leave, and I expected he would be at Leavenworth by May 1, but he has not yet come. As soon as he reaches Leavenworth, or St. Louis even, I consent to your going to Omaha to begin what, I trust, will be the real beginning of the great road. I start to-morrow for Riley, whence I will cross over to Kearney by land, and thence come in to Omaha, where I hope to meet you. I will send your letter this morning to Pope's office and indorse your request that a telegraph message be sent to General Pope to the effect that he is wanted at Leavenworth. Hoping to meet you soon, I am,

Yours, truly,

W. T. SHERMAN, *M. G.*

The organization for work on the plains away from civilization was as follows: Each of our surveying parties consisted of a chief, who was an experienced engineer, two assistants, also civil engineers, rodmen, flagmen, and chainmen, generally graduated civil engineers but without personal experience in the field, besides axmen, teamsters, and herders. When the party was expected to live upon the game of the country a hunter was added. Each party would thus consist of from eighteen to twenty-two men, all armed. When operating in a hostile Indian country they were regularly drilled, though after the civil war this was unnecessary, as most of them had been in the army. Each party entering a country occupied by hostile Indians was generally furnished with a military escort of from ten men to a company under a competent officer. The duty of this escort was to protect the party when in camp. In the field the escort usually occupied prominent hills commanding the territory in which the work was to be done, so as to head off sudden attacks by the Indians. Notwithstanding this protection, the parties were often attacked, their chief or some of their men killed or wounded, and their stock run off.

In preliminary surveys in the open country a party would run from 8 to 12 miles of line in a day. On location in an open country 3 or 4 miles would be covered, but in a mountainous country generally not to exceed a mile. All hands worked from daylight to dark, the country being reconnoitered ahead of them by the chief, who indicated the streams to follow, and the controlling points in summits and river crossings. The party of location that followed the preliminary surveys had the maps and profiles of the line selected for location and devoted its energies to obtaining a line of the lowest grades and the least curvature that the country would admit.

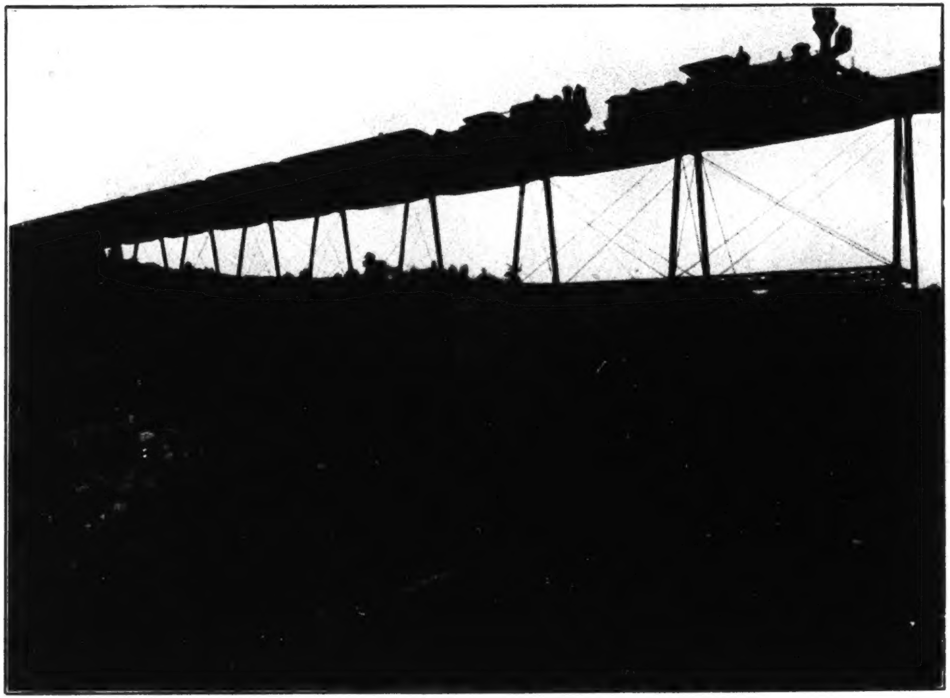
The location party in our work on the Union Pacific was followed by the construction corps, grading generally 100 miles at a time. That distance was graded in about thirty days on the plains, as a rule, but in the mountains we sometimes had to open our grading several hundred miles ahead of our track in order to complete the grading by the time the track should reach it. All the supplies for this work had to be hauled from the end of the track, and the wagon transportation was enormous. At one time we were using at least

10,000 animals, and most of the time from 8,000 to 10,000 laborers. The bridge gangs always worked from 5 to 20 miles ahead of the track, and it was seldom that the track waited for a bridge. To supply 1 mile of track with material and supplies required about 40 cars, as on the plains everything, rails, ties, bridging, fastenings, all railway supplies, fuel for locomotives and trains, and supplies for men and animals on the entire work, had to be transported from the Missouri River. Therefore, as we moved westward, every hundred miles added vastly to our transportation. Yet the work was so systematically planned and executed that I do not remember an instance in all the construction of the line of the work being delayed a single week for want of material. Each winter we planned the work for the next season. By the opening of spring, about April 1, every part of the machinery was in working order, and in no year did we fail to accomplish our work. After 1866 the reports will show what we started out to do each year, and what we accomplished.

The following extract from a letter written to me by Gen. W. T. Sherman as to what we promised to do in 1867, which was only about one-half what we prepared to do and did accomplish in 1868, indicates how one year's experience helped us in the progress of the next. It also shows, what the country now seems in a great measure to have forgotten, that the Pacific Railroad, now regarded chiefly in the light of a transcontinental, commercial highway, was then looked upon as a military necessity and as the one thing positively essential to the binding together of the republic East and West:

> St. Louis, *January 16, 1867.*
>
> My Dear Dodge: I have just read with intense interest your letter of the 14th, and, though you wanted it kept to myself, I believe you will sanction my sending it to General Grant for his individual perusal, to be returned to me. It is almost a miracle to grasp your purpose to finish to Fort Sanders (288 miles) this year, but you have done so much that I mistrust my own judgment and accept yours. I regard this road of yours as the solution of the Indian affairs and the Mormon question, and, therefore, give you all the aid I possibly can, but the demand for soldiers everywhere and the slowness of enlistment, especially among the blacks, limit our ability to respond. Each officer exaggerates his own troubles and appeals for men. I now have General Terry on the upper Missouri, General Augur with you, and General Hancock just below, all enterprising young men, fit for counsel or for the field. I will endeavor to arrange so that hereafter all shall act on common principles and with a common purpose, and the first step, of course, is to arrange for the accumulation of the necessary men and materials at the right points, for which your railroad is the very thing. So far as interest in your section is concerned, you may rest easy that both Grant and I feel deeply concerned in the safety of your great national enterprise.

It was not until after November, 1867, when we had been at work two years, that we got railroad communication with the East at Coun-



DALE CREEK BRIDGE.

Main line, Union Pacific Railway.

cil Bluffs, Iowa, the initial point of the Union Pacific Railway, by the completion of the Northwestern Railway. Till then the Missouri River had been the sole route over which supplies could be had. It was available only about three months of the year, and our construction was limited by the quantities of rail and equipment that could be brought to us by boat in that time. In twelve months of work after we had rail communication, we located, built, and equipped 587 miles of road, working only from one end, transporting everything connected with it an average distance of 800 miles west of the Missouri River. This feat has not yet been surpassed. In accomplishing it we crossed the divide of the continent and two ranges of mountains, one of which was the Wasatch, where in the winter of 1868–69 we had to blast the earth the same as the rocks.

Our Indian troubles commenced in 1864 and lasted until the tracks joined at Promontory. We lost most of our men and stock while building from Fort Kearney to Bitter Creek. At that time every mile of road had to be surveyed, graded, tied, and bridged under military protection. The order to every surveying corps, grading, bridging, and tie outfit was never to run when attacked. All were required to be armed, and I do not know that the order was disobeyed in a single instance, nor did I ever hear that the Indians had driven a party permanently from its work. I remember one occasion when they swooped down on a grading outfit in sight of the temporary fort of the military some 5 miles away, and right in sight of the end of the track. The government commission to examine that section of the completed road had just arrived, and the commissioners witnessed the fight. The graders had their arms stacked on the cut. The Indians leaped from the ravines, and, springing upon the workmen before they could reach their arms, cut loose the stock and caused a panic. Gen. Frank P. Blair, General Simpson, and Doctor White were the commissioners, and they showed their grit by running to my car for arms to aid in the fight. We did not fail to benefit from this experience, for, on returning to the East the commission dwelt earnestly on the necessity of our being protected.

From the beginning to the completion of the road our success depended in a great measure on the cordial and active support of the army, especially its commander in chief, General Grant, and the commander of the Military Division of the West, General Sherman. He took a personal interest in the project. He visited the work several times each year during its continuance, and I was in the habit of communicating with him each month, detailing my progress and laying before him my plans. In return I received letters from him almost every month. We also had the cordial support of the district commanders of the country through which we operated—General

Augur, General Cook, General Gibbon, and General Stevenson, and their subordinates. General Grant had given full and positive instructions that every support should be given to me, and General Sherman in the detailed instructions practically left it to my own judgment as to what support should be given by the troops on the plains. They were also instructed to furnish my surveying parties with provisions from the posts whenever our provisions should give out, and the subordinate officers, following the example of their chiefs, responded to every demand made, no matter at what time of day or night, what time of year or in what weather, and took as much interest in the matter as we did.

General Sherman's great interest in the enterprise originated from the fact that he personally, in 1849, took from General Smith, commander on the Pacific coast, the instructions to Lieutenants Warner and Williamson, of the engineers, who made the first surveys coming east from California, to ascertain, if possible, whether it was practicable to cross the Sierra Nevada range of mountains with a railroad. These instructions were sent at General Sherman's own suggestion, and the orders and examination preceded the act of Congress making appropriations for explorations and surveys for a railroad route from the Mississippi River to the Pacific Ocean by four years. General Sherman's interest lasted during his lifetime, and was signalized in the closing days of his official life by a summary of transcontinental railroad construction, the most exhaustive paper on the subject I have ever seen.

When I took charge as chief engineer of the Union Pacific Railway in 1866, I knew that my first duty would be to determine the crossing of the line over the Black Hills, a bold, high spur of the Rocky Mountains, and I concentrated my engineering forces for that purpose. It had already been ascertained that we could get down to the Laramie plains from the summit going west, but the route had not been determined going east. In my examinations made while coming home from the Powder River expedition in 1865 I had found what I believed to be the most practicable route from the summit to the foot of the mountains on the east, and directed that it be examined. This was immediately done, and the route was found practicable.

After the battle of Atlanta, my assignment to the Department of the Missouri brought the country between the Missouri River and California under my command, and then I was charged with the Indian campaigns of 1865 and 1866. I traveled again over all that portion of the country I had explored in former years, and saw the beginning of that great future that awaited it. I then began to comprehend its capabilities and resources; and in all movements of our troops and scouting parties I had reports made upon the country—its resources and topography; and I, myself, during the two years traversed it east and west, north and south, from the Arkansas to the Yellowstone, and from the Missouri to Salt Lake basin.

It was on one of these trips that I discovered the pass through the Black Hills and gave it the name of Sherman, in honor of my great chief. Its elevation is 8,236 feet, and for years it was the highest point reached by any railroad in the United States. The circumstances of this accidental discovery may not be uninteresting.

While returning from the Powder River campaign, I was in the habit of leaving my troops and trains, and with a few men, examining all the approaches and passes from Fort Laramie south over the secondary range of mountains known as the Black Hills, the most difficult to overcome with proper grades of all the ranges, on account of its short slopes and great height. When I reached the Lodge Pole Creek, up which went the overland trail, I took a few mounted men—I think six—and with one of my scouts as guide, went up the creek to the summit of Cheyenne Pass, striking south along the crest of the mountains to obtain a good view of the country, the troops and trains at the same time passing along the east base of the mountains on what was known as the St. Vrain and the Laramie trail.

About noon, in the valley of a tributary of Crow Creek, we discovered Indians, who, at the same time, discovered us. They were between us and our trains. I saw our danger and took means immediately to reach the ridge and try to head them off, and follow it to where the cavalry could see our signals. We dismounted and started down the ridge, holding the Indians at bay, when they came too near, with our Winchesters. It was nearly night when the troops saw our smoke signals of danger and came to our relief; and in going to the train we followed this ridge out until I discovered it led down to the plains without a break. I then said to my guide that if we saved our scalps I believed we had found the crossing of the Black Hills—and over this ridge, between Lone Tree and Crow creeks, the wonderful line over the mountains was built. For over two years all explorations had failed to find a satisfactory crossing of this range. The country east of it was unexplored, but we had no doubt we could reach it.

The year 1866 was spent in determining the crossing of the Rocky Mountains or the Black Hills, and the approaches to them from the east. It was the great desire of the company to build the line through Denver, Colo., if possible, up the South Platte Valley and crossing the mountains west of Denver and reaching Salt Lake by the Yampa, White, and Uinta valleys, and I covered the country from the Laramie Canyon on the north to the Arkansas on the south, examining all the mountain passes and approaches and examined all these lines personally. These surveys demonstrated that there was no question as to where the line should cross these mountains. The general examination of the plains along the east foot of the mountains showed that the plains rose from the Arkansas north until they reached their apex at the valley of Crow Creek, near where Cheyenne now stands. Then they fell to the north toward the Laramie, and when we came to examine the summits of these mountains, we found their lowest altitude was in the vicinity of the Cheyenne Pass, so that there was no question as to where our line should run. The line up the Platte and up the Lodge Pole and by the Lone Tree Pass which I had discovered, was far superior to any other line, and it forced us to abandon the line in the direction of Denver, and we had in view the building of a branch from Crow Creek to Denver, about 112 miles long. I reported the result of my examination on November 15, 1866, to the company, and on November 23, 1866, the company adopted the lines which I had recommended, and I immediately proceeded to develop them for building the next year. We also examined this year the line by the way of the North Platte, Fort Laramie, Sweet Water Creek and the South Pass, reaching Salt Lake by the way of the Big Sandy and Black Fork. This line avoided the crossing of the Black Hills and the heavy grade ascending from the east to the summit and the ninety-foot grade dropping down into the Laramie plains, but this line was some forty miles longer than the direct line by the Lodge Pole, and on this line there was no development of coal as there was on the line adopted by the company, and on presenting this question to the Government, they decided against the North Platte and South Pass line. The chiefs of parties for this work were: James A. Evans, who was an engineer of great ability, Mr. P. T. Brown, who was an assistant engineer, a young man who started out in 1864 as a rodman. He made the surveys through Clear Creek to the Middle Park, over the Burthud Pass; also the Boulder Pass. On this pass in November, the party was caught in the severest snow storm known in the mountains, and he was obliged to abandon his pack train and save his party by working his way eastward through the storm to Boulder Creek. His stock drifted to Middle Park. There they wintered near the hot springs. I received knowledge through one of my old mountain friends that they were there in good condition, and we recovered them in the spring. Mr. L. L. Hills, assistant engineer, had charge of the surveys on the Lodge Pole line and up the Cache La Poudre River to Laramie Plains, and Mr. J. E. House had charge of the surveys, soundings, and examination of the Missouri River. Mr. F. A. Case, division engineer, was completing the examination of the passes through the main range, made the year before, and Mr. F. H. Ainsworth was running the lines in the Platte Valley, while Mr. Thomas H. Bates had charge of the surveys in Utah and west to the California state line. The explorations and surveys of 1866 had only confirmed the reconnoissance made in the fifties by Mr. Dey and myself of the general route of the Union Pacific Railroad, so that for the years to come our work would be almost entirely devoted to the final locations.

In the spring of 1867 I received a letter from General Grant, suggesting that in my explorations during the year 1867, I take with me his chief of staff, Gen. John A. Rawlins, for the benefit of his health. General Rawlins had shown a tendency toward consumption, and it was thought that three or four months in camp on the plains would be of great benefit to him. I therefore with great pleasure invited General Rawlins to accompany me, with such friends as he might select. He came to me at Omaha, bringing with him Maj. J. W. McK. Dunn, A. D. C., and John E. Corwith, of Galena, Ill., and added to this party on my invitation was John R. Duff, son of a director of the road, and Mr. David Van Lennep, my geologist. We had as an escort two companies of cavalry and two of infantry, under the command of Lieut. Col. J. K. Mizner, who had with him Lieut. J. W. Wheelan and Dr. Henry B. Terry, assistant surgeon, U. S. Army. They accompanied me during the entire summer. We started out the 1st of [illegible]ne and went to the end of the track, which was then at North P[illegible]e, and from there we marched immediately up the Platte, then up the Lodge Pole to the east base of the Black Hills, where we were joined by Gen. C. C. Augur, who was then in command of that department, with his staff. General Augur's instructions were to locate the military post where I located the end of the division, at the east base of the mountains, and after a thorough examination of the country, I located the division point on Crow Creek, where Cheyenne now stands, and named it Cheyenne, and General Augur immediately located just north of the town the military post of D. A. Russell. We spent the Fourth of July at this place, and Gen. John A. Rawlins delivered a very remarkable and patriotic speech.

At this time the heaviest settlement was Denver, some 112 miles away. While we were camped here the Indians swooped down out of the ravine of Crow Creek and attacked a Mormon grading train and outfit that was coming from Salt Lake to take work on the road and killed two if its men. Our cavalry hastily mounted and drove off the Indians and saved their stock. We buried the men and started the graveyard of the future city, now the capital of the State of Wyoming.

In the spring of 1867 there was a party in the field under L. L. Hills running a line east from the base of the Rocky Mountains. The first word I received from it was through the commanding officer at Camp Collins, who had served under me while I commanded the department. He informed me that a young man named J. M. Eddy had brought the party into that post, its chief having been killed in a fight with the Indians. I inquired who Eddy was and was informed that he was an axman in the party, and had served under me in the civil war. I ordered him to meet me with his party on the Lodge Pole as I traveled west. He turned out to be a young boy who had entered the Thirteenth Illinois when only 16 or 17. The fight in which Mr. Hills, the chief, was killed occurred some 6 miles east of Cheyenne, and after the leader was lost young Eddy rallied the party and by the force of his own character took it into Camp Collins. Of course I immediately promoted him. He was with me during the entire construction of the Union Pacific, rising from one position to another, until he became the general manager of portions of the great Southwestern system. He died in the railway service.

After meeting this party, I completed the location of the line to Crow Creek, at the foot of the mountains, now known as Cheyenne.

We marched west across the Black Hills and Laramie Plains and passed through Rattle Snake Hills Pass, following down a stream that emptied into the Platte just opposite Fort Steele and at a point where the Union Pacific now crosses the North Platte River. We crossed this stream by swimming our horses and proceeded west. The country from the Platte west to the Bitter Creek is very dry, no running water in it, and before we reached camp General Rawlins became very thirsty, and we started out in an endeavor to find running water, and I discovered a spring in a draw near where the town of Rawlins now stands. When General Rawlins reached this spring he said it was the most gracious and acceptable of anything he had had on the march, and also said that if any thing was ever named for him, he wanted it to be a spring of water, and I said then, "We will name this Rawlins Springs." It took that name. The end of one of our divisions happened to be close to this spring, and I named the station Rawlins, which has grown now into quite a town and a division point of the Union Pacific road.

As soon as I had determined the line over the Black Hills, I learned that one of the parties which was trying to work west from the North Platte had found the maps of the country misleading. Endeavoring to find the summit of the continental divide, this party had dropped into a great basin. Percy T. Brown, the chief of the party, finding himself in an unknown country entirely different in character from what had been expected, took eight of his escort and

GENERAL G. M. DODGE AND PARTY OF EXPLORATION.

Left to right, standing: Lieut. J. W. Wheelan, Lieut. Col. J. K. Mizner, Dr. Henry B. Terry, John E. Corwith.
Left to right, sitting: D. Van Lennep, John R. Duff, Gen. G. M. Dodge, John A. Rawlins, J. W. McK. Dunn.

started to explore the region. When near the center of what is now known as the Red Desert he was attacked by 300 Sioux Indians working south to the Bridger Pass stage road coming from the Sweetwater. Brown took measures to defend himself, occupying, after a severe contest with the Indians for its possession, a small hill, and fighting from 12 o'clock noon until toward night, when he was shot through the abdomen. He then ordered the soldiers to leave him and save themselves, but they refused, and allowed the Indians to get hold of the stock, after which the redskins withdrew. The soldiers then made a litter of their carbines and packed Brown upon it 15 miles through the sagebrush to Laclere station, near Bridgers Pass. Their laborious efforts to save him were made in vain, however, for Brown died at the station.

Upon an examination of this country we discovered that the divide of the continent had let down from the Wind River Mountains on the north to Medicine Bow, the beginning of the main Rocky Mountains on the south from an elevation of 13,000 feet to one of 7,000 into an open plain, and that the divide was in reality a great basin about 80 miles across in its widest part east and west, and 100 to 150 miles northwest and southeast in its longest part. The streams running into it sink, leaving a red soil over the entire basin, from which it receives the name of the Red Desert. The Union Pacific Railway crossed the Red Desert near its southern limit, between the stations of Creston and Tipton, a distance of about 34 miles.

In the basin we found and rescued the party headed by Thomas F. Bates, which was coming from Green River east. When I reached what is now Creston I discovered Bates and his party. They had been in the widest part of the basin for nearly a week without water, and were almost exhausted. When we discovered them they had abandoned the line and were taking a course due east by the compass, running for water. At first we thought them Indians, but on looking through my glasses I saw that they had teams with them. We went to their relief at once and saved them. They were in a deplorable condition from thirst.

On the western rim of the basin, as I left it, I ran into the remains of some old wagons and other articles which indicated that some military force had tried to cross there. Afterwards I learned that it had been Colonel Steptoe's expedition to Oregon, and that in crossing from Bridgers Pass trying to reach northwest, they struck this country and were obliged to abandon a portion of their outfit. This demonstrated that no knowledge of this depression was had by anyone until we developed it in our surveys. We had great difficulty in obtaining water for the operation of our road through the basin, being obliged to sink artesian wells to a great depth. After reaching the west rim of the Red Desert you immediately drop into the valley of Bitter Creek, the waters of which flow into the Pacific. The crossing of the continental divide by the Union Pacific is thus by way of an open prairie of comparatively low elevation, about 7,000 feet, instead of a mountain range. The work of building the road there was unexpectedly light, and it almost seems that nature made this great opening in the Rocky Mountains expressly for the passage of a transcontinental railway.

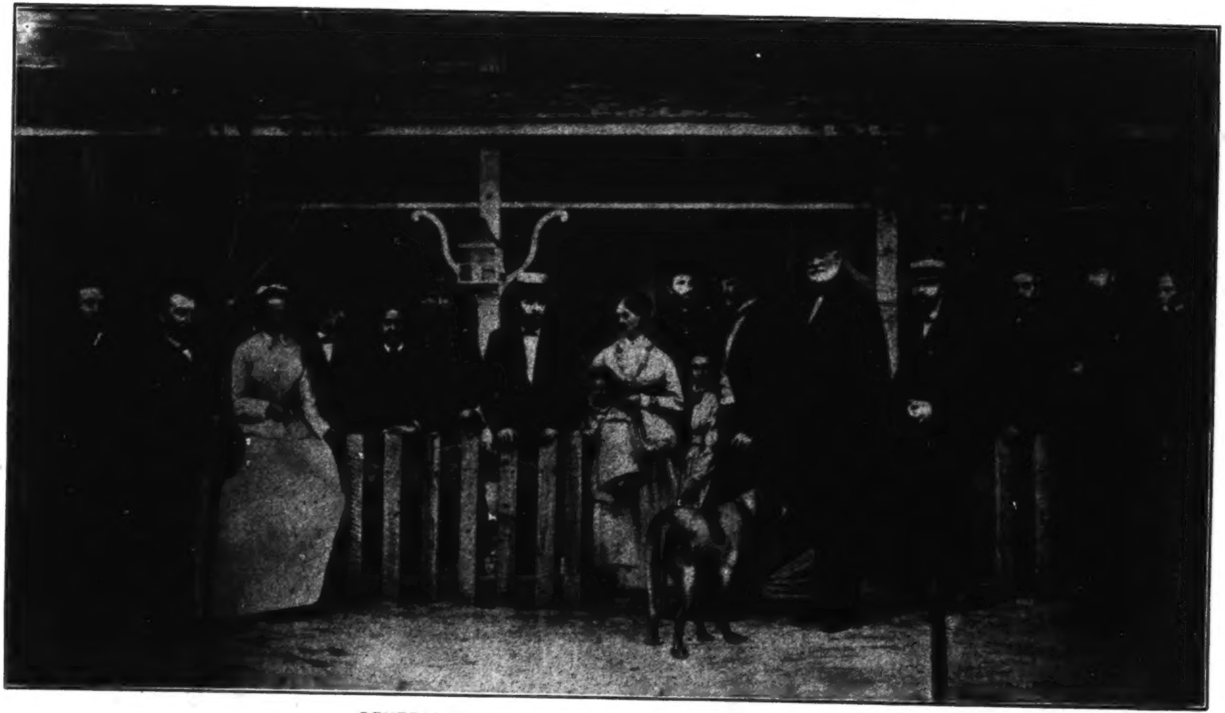
The law of 1862 provided that the Union Pacific and Central Pacific should join their tracks at the California state line. The law of 1864 allowed the Central Pacific to build 150 miles east of the state line, but that was changed by the law of 1866, and the two companies allowed to build, one east and the other west, until they met. The building of 500 miles of road during the summers of 1866 and 1867, hardly twelve months' actual work, had aroused great interest in the country, and much excitement, in which the Government took a part. We were pressed to as speedy a completion of the road as possible, although ten years had been allowed by Congress. The officers of the Union Pacific had become imbued with this spirit, and they urged me to plan to build as much road as possible in 1868. I have already alluded to the completion of the Northwestern Railway in December, 1867, to Council Bluffs, Iowa, which gave us an all-rail connection with the East, so that we could obtain our rail material and equipment during the entire year. The reaching of the summit of the first range of the Rocky Mountains, which I named Sherman, in honor of my old commander, in 1867, placed us comparatively near good timber for ties and bridges, which, after cutting, could be floated down the mountain streams at some points to our crossing, and at others to within 25 or 30 miles of our work. This afforded great relief to the transportation.

In the fall of 1867, when we closed our work and ended our track at the summit of the Black Hills, the company was apparently at their end, so far as finances were concerned, and were greatly disturbed as to the future. When I had received all of my parties' reports, extending to the California state line, and had completed the profiles, maps, and estimates, I went on to New York and met the board of directors, and when they saw the very favorable line that we had obtained over the Black Hills, across the Laramie plains and over the divide of the continent, where they had expected to meet very heavy work, and also the line over the Wasatch Range to Salt Lake and from there on west, they were very much encouraged. The estimates on this line were not more than one-half of what they had expected, and then a few miles west of Cheyenne they would commence receiving $48,000 in government bonds per mile for 150 miles, and from there on $32,000 in government bonds per mile, which was a great advance on the amount that they had received on the 630 miles from the Missouri River to the east base of the mountains, which was only $16,000 in government bonds per mile, while the cost of the work had been very heavy on account of the long distance rails, timber, supplies, and everything had to be hauled and the extra cost from the fact that the country furnished nothing for the road. The company immediately made extraordinary effort to provide the money to build to Salt Lake, and during the winter I received instructions to make every effort to build as much line as possible the coming year, and the company forwarded to us at our base on the Missouri River an immense amount of rails, fastenings, etc., as we then had rail connections by the Northwestern road all the way to Council Bluffs.

We made our plans to build to Salt Lake, 480 miles, in 1868, and to endeavor to meet the Central Pacific at Humboldt Wells, 219 miles west of Ogden, in the spring of 1869. I had extended our surveys during the years 1867 and 1868 to the California state line, and laid my plans before the company, and the necessary preparations were made to commence work as soon as frost was out of the ground, say about April 1. Material had been collected in sufficient quantities at the end of the track to prevent any delay. During the winter ties and bridge timber had been cut and prepared in the mountains to bring to the line at convenient points, and the engineering forces were started to their positions before cold weather was over, that they might be ready to begin their work as soon as the temperature would permit. I remember that the parties going to Salt Lake crossed the Wasatch Mountains on sledges, and that the snow covered the tops of the telegraph poles. We all knew and appreciated that the task we had laid out would require the greatest energy on the part of all hands. About April 1, therefore, I went onto the plains myself and started our construction forces, remaining the whole summer between Laramie and the Humboldt Mountains. I was surprised at the rapidity with which the work was carried forward. Winter caught us in the Wasatch Mountains, but we kept on grading our road and laying our track in the snow and ice at a tremendous cost. I estimated for the company that the extra cost of thus forcing the work during that summer and winter was over $10,000,000, but the instructions I received were to go on, no matter what the cost. Spring found us with the track at Ogden, and by May 1 we had reached Promontory, 534 miles west of our starting point twelve months before. Work on our line was opened to Humboldt Wells, making in the year a grading of 754 miles of line.

The Central Pacific had made wonderful progress coming east, and we abandoned the work from Promontory to Humboldt Wells, bending all our efforts to meet them at Promontory. Between Ogden and Promontory each company graded a line, running side by side, and in some places one line was right above the other. The laborers upon the Central Pacific were Chinamen, while ours were Irishmen, and there was much ill-feeling between them. Our Irishmen were in the habit of firing their blasts in the cuts without giving warning to the Chinamen on the Central Pacific working right above them. From this cause several Chinamen were severely hurt. Complaint was made to me by the Central Pacific people, and I endeavored to have the contractors bring all hostilities to a close, but, for some reason or other, they failed to do so. One day the Chinamen, appreciating the situation, put in what is called a "grave" on their work, and when the Irishmen right under them were all at work let go their blast and buried several of our men. This brought about a truce at once. From that time the Irish laborers showed due respect for the Chinamen, and there was no further trouble.

When the two roads approached in May, 1869, we agreed to connect at the summit of Promontory Point, and the day was fixed so that trains could reach us from New York and California. We laid the rails to the junction point a day or two before the final closing. Coming from the East, representing the Union Pacific, were Thomas C. Durant, vice-president; Sidney Dillon, who had taken a prominent part in the construction of the road from the beginning, and John R. Duff, directors, together with the consulting engineer and a carload of friends. From the West the representatives of the Central Pacific were its president, Leland Stanford; Mr. Collis P. Huntington, Mr. Crocker, Mr. Hopkins, Mr. Colton, and other members of that company, and Mr. Montague, chief engineer, and a detachment of troops from Camp Douglass, Salt Lake City. The two trains pulled up facing each other, each crowded with workmen who sought advantageous positions to witness the ceremonies, and literally covered the cars. The officers and invited guests formed on each side of the track, leaving it open to the south. The telegraph lines had been brought to that point, so that in the final spiking as each blow was struck the telegraph recorded it at each connected office from the Atlantic to the Pacific. Prayer was offered, a number of spikes were driven in the two adjoining rails, each one of the prominent persons present taking a hand, but very few hitting the spikes, to the great amusement of the crowd. When the last spike was placed, light taps were given upon it by several officials, and it was finally driven home by the chief engineer of the Union Pacific Railway. The engineers ran up their locomotives until they touched, the engineer upon each



GENERAL GRANT AND PARTY VISIT GENERAL DODGE.

Summer of 1868, Fort Sanders, Wyoming.

From left to right: Gen. August Kautz, Gen. Philip H. Sheridan, Mrs. Potter, Gen. Frederick Dent, Mrs. Gibbon, Gen. John Gibbon, Master John Gibbon, Gen. U. S. Grant, Katie Gibbon, Mrs. Kilburn, Allie Porter, Gen. G. M. Dodge, Lieut. Gen. Wm. T. Sherman, Gen. Wm. S. Harney, Dr. T. C. Durant, Gen. Adam Slemmer, Gen. Joseph C. Potter, Gen. Louis C. Hunt.

engine breaking a bottle of champagne upon the other one, and thus the two roads were wedded into one great trunk line from the Atlantic to the Pacific. Spikes of silver and gold were brought specially for the occasion, and later were manufactured into miniature spikes as mementos of the occasion. It was a bright but cold day. After a few speeches we all took refuge in the Central Pacific cars, where wine flowed freely, and many speeches were made.

Telegrams were sent to President Grant, Vice-President Colfax, and other officials throughout the country. I did not fail to send a message to my old commander, who had been such a helpful factor in the building of the road, and I received this message in response:

> WASHINGTON, *May 11, 1869.*
>
> GEN. G. M. DODGE: In common with millions, I sat yesterday and heard the mystic taps of the telegraph battery announce the nailing of the last spike in the great Pacific road. Indeed, am I its friend? Yes. Yet, am I to be a part of it, for as early as 1854 I was vice-president of the effort begun in San Francisco under the contract of Robinson, Seymour & Co. As soon as General Thomas makes certain preliminary inspections in his new command on the Pacific, I will go out, and, I need not say, will have different facilities from that of 1846, when the only way to California was by sail around Cape Horn, taking our ships 196 days. All honor to you, to Durant, to Jack and Dan Casement, to Reed, and the thousands of brave fellows who have wrought out this glorious problem, spite of changes, storms, and even doubts of the incredulous, and all the obstacles you have now happily surmounted.
>
> W. T. SHERMAN, *General.*

That night the visitors started east and west, leaving the engineers and working parties to arrange the details for conducting the business of each road at this terminal. It was only a day or two before trains bound for the Atlantic and Pacific were passing regularly.

During the building of the road from Sherman west, many questions arose in relation to the location, construction, the grades and curvatures of the work. All through I stood firmly for my line, for what I considered was a commercially economical line for the company, and for what I thought we ought to build under the specifications of the Government. News of the contest between the company and the contractors reached Washington through the government commissioners. Generals Grant and Sherman were much interested, and in 1868 they came West with a party consisting of Maj. Gen. Philip H. Sheridan, Gen. August Kautz, Gen. Joseph C. Potter, Gen. Frederick Dent, Gen. William S. Harney, Gen. Louis C. Hunt, Gen. Adam Slemmer, Sidney Dillon, and T. C. Durant, who wired me to meet them at Fort Sanders, then the headquarters of General Gibbon. The questions in dispute between myself and the contractors were then taken up, and Generals Grant and Sherman took decided grounds in the matter, supporting me fully, so that I had no further trouble. A view of this gathering of officers was caught by a local photographer who happened to be at the post, and is reproduced here. Probably no more noted military gathering has occurred since the civil war.

Two changes were made by the contractors in the line so as to cheapen the work, and this was at the expense of the commercial value of the property. This was always opposed by the division engineer who located the line, and he was supported by the chief engineer. The changes were always made when the chief engineer was absent. The company would agree to a change, and the work on the changes would be so far advanced that it was too late to rectify the matter when the chief engineer returned. The first change was of Mr. James A. Evans's location on the eastern slope of the Black Hills from Cheyenne to Sherman. Evans had a 90-foot equated grade with a 6° maximum curvature. It was a very fine location, and the amount of curvature was remarkably small for a mountain line. It rose 90 feet to the mile in a steady climb. Col. Silas Seymour, the consulting engineer, undertook to reduce this grade to 80 feet, but increased the curvature so much that an engine would haul more cars over Evans's 90-foot grade than on Seymour's 80-foot grade, but Seymour was obliged, when he reached the foot of the mountains, to put in a 90-foot grade to save work as he dropped off the foothills to the plains, and a portion of this grade remains to-day. When Evans took up the change in his report and compared it with his line, he made it so plain that the change was wrong that the government directors adopted it for their report.

The next change was from Laramie River to Rattlesnake Hills, or Carbon Summit. The original line ran north of Cooper Lake, and O'Neil, who had instructions to locate on that line, changed it, by order of Col. Silas Seymour, consulting engineer, to a line dropping into the valleys of Rock Creek and Medicine Bow River, to save work. This increased the length of the line 20 miles and caused the report that we were making the road crooked to gain mileage and secure $48,000 per mile of the bonded subsidy. The amount of grading on this line was about one-half of that on the original line. During 1903 and 1904, in bringing the Union Pacific line down to a maximum grade of 47 feet to the mile, except over the Wasatch Range and Black Hills, the company abandoned this principal change made by the consulting engineer, and built on or near my original location, saving about 20 miles in distance. It was this change that brought Generals Grant and Sherman to see me and insist on my remaining as chief engineer. At the time this change was made the chief engineer was in Salt Lake, and did not know of

TEMPORARY TRESTLE, PROMONTORY, UTAH.

it until it was practically graded. He entered his protest and notified the company that he would not submit to such changes without being consulted.

I remember that the progress of the work was then such that Generals Grant and Sherman were very enthusiastic over the belief that we would soon reach the summit of the Wasatch Mountains, but I could not convince them that a junction of the two roads was in sight within a year. When you consider that not a mile of this division of the road had been located on April 1, 1868; that not a mile of this work had been opened; that we covered in that year over 700 miles of road and built 555 and laid 589 miles of track, bringing all of our material from the Missouri River, it is no wonder that Generals Grant and Sherman could not understand how the problem before us would be so speedily solved. As each 100 miles of road was completed there came a general acclaim from all parts of the country to our great encouragement, while from our chiefs in New York there was a continual pressure for speed, they giving us unlimited means and allowing us to stretch our forces out hundreds of miles, no matter what additional cost it made to each mile of road. Then we had the sympathy of the whole Mormon Church with us, President Young giving the matter personal attention, and seeing that the line over the Wasatch Mountains down the canyon and westward was covered by Mormons, to whom we let contracts, and we had the additional incentive that the Central Pacific was coming east nearly as fast as we were going west.

We had only one controversy with the Mormons, who had been our friends and had given the full support of the church from the time of our first reconnoissances until the final completion. It was our desire and the demand of the Mormons that we should build through Salt Lake City, and we bent all our energies to find a feasible line passing through that city and around the south end of Great Salt Lake and across the desert to Humboldt Wells, a controlling point in the line. We found the line so superior on the north of the lake that we had to adopt that route with a view of building a branch to Salt Lake City, but Brigham Young would not have this, and appealed over my head to the board of directors, who referred the question to the government directors, who fully sustained me. Then Brigham Young gave his allegiance and aid to the Central Pacific, hoping to bring them around the south end of the lake and force us to connect with them there. He even went so far as to deliver in the tabernacle a great sermon denouncing me, and stating a road could not be built or run without the aid of the Mormons. When the Central Pacific engineers made their survey they, too, were forced to adopt a line north of the lake. Then President Young returned to his first love, the Union Pacific, and turned all his forces and aid to that road.

During the building of the road the question of bridging the Missouri River was under discussion, and continuous examinations of the river in sounding, watching currents, etc., was had. Three points were finally determined upon as most feasible. First, Childs Mill, which was a high bridge, the shortest, and reached Muddy Creek with a 35-foot grade, avoiding the heavy 66-foot grade at Omaha; second, Telegraph Pole, right where there was some rock bottom, this to be a low drawbridge; and third, The M. & M. crossing for a high bridge. The latter was decided upon more especially to meet the views of Omaha, and for aid that city gave the company. We began work on the bridge in 1868, and continued it in 1869 and 1870, but the company found it impossible to continue, as they had no funds, and they could not issue any securities under their charter to pay for the work. I was very anxious the bridge should be built to utilize the thousand acres of land I had bought for our terminals in Iowa, and to fix permanently and practically the terminus in Iowa. The company proposed to me to organize a bridge company to interest the Iowa roads terminating at Council Bluffs, and ask authority from the Government to construct the bridge and issue securities upon it, the Union Pacific agreeing to use the bridge and make its terminals and connections with the Iowa roads on the Iowa side. I incorporated the Council Bluffs Railway and Missouri Bridge Company, and went before Congress for permission to bridge the Missouri River at the M. & M. crossing. I saw all the Iowa roads. They agreed to give their aid, but made the condition that their connection with the Union Pacific should be on the Iowa side. I went to Washington, presented the bill, passed it through the House, and left it in Senator Harlan's hands to pass it in the Senate. This was very quietly done, but Omaha got alarmed, and Governor Saunders, who was a personal friend of Senator Harlan, took the matter up, and, I think, went to Washington. The Omaha people interested themselves in stirring up opposition in Council Bluffs. A public meeting was held at the corner of Broadway and Pearl streets, over which Mr. J. W. Crawford presided. I was very seriously criticised and the independent bridge scheme denounced, the contention being that the bridge should be a part of the Union Pacific, although it was entirely and solely in the interests of Council Bluffs, and would have brought the terminus and business of the Union Pacific to the Bluffs, as they had entered into an agreement with the Iowa roads to that effect. The public meeting was addressed in favor of the bridge by Messrs. Pusey, Officer, and myself, also Mr. Caleb Baldwin and others, and was opposed by Messrs. James Montgomery, Larimer, and others.

The meeting passed resolutions asking our Senators to defeat the bridge bill. Senator Harlan acted on this resolution and defeated the bill in the Senate, and Saunders and Omaha accomplished their work. The Union Pacific Company was greatly disgusted and disappointed, and dropped for the time all efforts to build a bridge. If the bill had passed the bridge would have been built in the interests of Council Bluffs and the Iowa roads. The Union Pacific later on applied to Congress, which passed a bill authorizing the Union Pacific to build a bridge, issue bonds and stock upon it, the interest upon them to be paid from the revenue of the bridge, and placed it entirely in their control, but the Union Pacific had no great interest in coming to Council Bluffs or Iowa, and made their terminus at Omaha, and forced the Iowa roads over the bridge until 1875, when the United States Supreme Court decided that the Union Pacific should be operated from Council Bluffs westward as a continuous line for all purposes of communication, travel, and transportation, and especially ordered them to start all through passenger and freight trains westward-bound from the Bluffs. This came too late to cure the mischief the town meeting had accomplished, as the Union Pacific had its interests centered in Omaha, its offices located there, and the Iowa roads had made their contracts and gone there, and the Bluffs has only reaped the benefit of its terminal that the growth of business has forced to them, whereas by law, by economy of operation, and by the ample terminals made to accommodate it, it should have been the actual terminus, and should have received full benefit of it, not only from traffic of the Union Pacific, but from the traffic and interest of the Iowa roads. The Union Pacific completed the first bridge crossing the Missouri River and opened it for traffic on March 22, 1872.

One of the most difficult problems we had to solve was to keep sufficient material at the terminals to supply the daily demand. This work fell to Webster Snyder and his assistant, H. M. Hoxie, who had charge of the operation of the completed road. They were both young men in the business then, but have been at the head of great corporations since. They performed their work successfully and with ability. Hoxie said to me once, in answer to a question:

> We do not take our hand off the throttle night or day until we know the front is supplied.

The operating department also had the Indians to contend with. An illustration of this came to me after our track had passed Plum Creek, 200 miles west of the Missouri River. The Indians had captured a freight train and were in possession of it and its crews. It so happened that I was coming down from the front with my car, which was a traveling arsenal. At Plum Creek station word came of this capture and stopped us. On my train were perhaps 20 men, some a portion of the crew, some who had been discharged and sought passage to the rear. Nearly all were strangers to me. The excitement of the capture and the reports coming by telegraph of the burning of the train brought all men to the platform, and when I called upon them to fall in, to go forward and retake the train, every man on the train went into line, and by his position showed that he was a soldier. We ran down slowly until we came in sight of the train. I gave the order to deploy as skirmishers, and at the command they went forward as steadily and in as good order as we had seen the old soldiers climb the face of Kenesaw under fire.

Nearly all the engineers and chiefs of the different units of the construction of the line have risen to distinction in their profession since the road was built. The chiefs of the parties were S. B. Reed, F. M. Case, James A. Evans, Percy T. Brown, L. L. Hills (the two latter killed by the Indians), J. E. House, M. F. Hurd, Thomas H. Bates, F. C. Hodges, James R. Maxwell, John O'Neil, Francis E. Appleton, Col. J. O. Hudnut, J. F. McCabe, Mr. Morris, and Jacob Blickensderfer.

Our principal geologist was David Van Lennep, whose reports upon the geology of the country from the Missouri River to the Pacific have been remarkably verified in later and more detailed examinations.

The superintendents of construction were S. B. Reed and James A. Evans, both of whom had been connected with the road since 1864. They had independent and thorough organizations. Mr. S. B. Reed was a very competent engineer and had had large experience in his profession. He was very successful in utilizing the Mormons in his work west of the Green River. Mr. Reed and Mr. Hurd afterwards made some of the most difficult locations over the mountain ranges for the Canadian Pacific.

Mr. Reed's principal assistant was M. F. Hurd, who served in the Second Iowa Infantry during the civil war. I detailed him on my staff as an engineer, and, although a private, he won distinction in all the campaigns for his ability, nerve, bravery, and modesty. On the Union Pacific, as well as other transcontinental lines with which he has been connected, he has performed some remarkable engineering work. He has had to fight many times for the lives of himself and party, and, no matter what odds have been against him, he has never failed to maintain his position and win his battles, though at times the chances looked desperate.

S. B. REED.

Superintendent of Construction, Union Pacific Railway.

GENERAL J. S. CASEMENT.

Casement Brothers laid all the track and did a large part of the grading of the Union Pacific Railway.

The track laying on the Union Pacific was a science. Mr. W. A. Bell, in an article on the Pacific Railroads, describes, after witnessing it, as follows:

> We, pundits of the far East, stood upon that embankment, only about a thousand miles this side of sunset, and backed westward before that hurrying corps of sturdy operators with a mingled feeling of amusement, curiosity, and profound respect. On they came. A light car, drawn by a single horse, gallops up to the front with its load of rails. Two men seize the end of a rail and start forward, the rest of the gang taking hold by twos, until it is clear of the car. They come forward at a run. At the word of command the rail is dropped in its place, right side up with care, while the same process goes on at the other side of the car. Less than thirty seconds to a rail for each gang, and so four rails go down to the minute. Quick work, you say, but the fellows on the Union Pacific are tremendously in earnest. The moment the car is empty it is tipped over on the side of the track to let the next loaded car pass it, and then it is tipped back again; and it is a sight to see it go flying back for another load, propelled by a horse at full gallop at the end of 60 or 80 feet of rope, ridden by a young Jehu, who drives furiously. Close behind the first gang come the gaugers, spikers, and bolters, and a lively time they make of it. It is a grand "anvil chorus" that those sturdy sledges are playing across the plains. It is in a triple time, three strokes to the spike. There are 10 spikes to a rail, 400 rails to a mile, 1,800 miles to San Francisco—21,000,000 times are those sledges to be swung; 21,000,000 times are they to come down with their sharp punctuation before the great work of modern America is complete.

The entire track and a large part of the grading on the Union Pacific Railway was done by the Casement Brothers—Gen. Jack Casement and Dan Casement. General Casement had been a prominent brigade and division commander in the western army. Their force consisted of 100 teams and 1,000 men, living at the end of the track in boarding cars and tents, and moved forward with it every few days. It was the best organized, best equipped, and best disciplined track force I have ever seen. I think every chief of the different units of the force had been an officer of the army, and entered on this work the moment they were mustered out. They could lay from 1 to 3 miles of track per day, as they had material, and one day laid 8½ miles. Their rapidity in track laying, as far as I know, has never been excelled. I used it several times as a fighting force, and it took no longer to put it into fighting line than it did to form it for its daily work. They not only had to lay and surface the track, but had to bring forward to the front from each base all the material and supplies for the track and for all workmen in advance of the track. Bases were organized for the delivery of material generally from 100 to 200 miles apart, according to the facilities for operation. These bases were as follows: First, Fremont; second, Fort Kearney; third, North Platte; fourth, Julesburg; fifth, Sidney; sixth, Cheyenne; seventh, Laramie; eighth, Benton (the last crossing of the

North Platte); ninth, Green River; tenth, Evanston; eleventh, Ogden; and, finally, Promontory.

At these bases large towns were established, which moved forward with the bases, and many miles of sidings were put in for switching purposes, unloading tracks, etc. At these prominent points I have seen as many as a thousand teams waiting for their loads to haul forward to the front for the railway force, the Government, and for the limited population then living in that country. I have seen these terminal towns starting first with a few hundred people until at Cheyenne, at the base of the mountains, where we wintered in 1867–68, there were 10,000 people. From that point they decreased until at Green River there were not over 1,000. After we crossed the first range of mountains we moved our bases so rapidly they could not afford to move with us.

In 1865 Oakes and Oliver Ames, of Boston, became interested in the enterprise, bringing their own fortune and a very large following, and really gave the first impetus to the building of the road. There was no man connected with it who devoted his time and money with the single purpose of benefit to the country and Government more than Oakes Ames, and there was never a more unjust, uncalled for, and ungrateful act of Congress than that which censured him for inducing, as it is claimed, Members of Congress to take interest in the construction company. When they took it there was no necessity for the company having influence in Congress, for there was nothing we could ask that Congress did not give, and it certainly never occurred to him that he might secure benefits from their votes. Now that the Government has been paid every dollar that it invested, with interest, it is time that the Congress of the United States should wipe that unjust act from its record.

The instructions given me by Oliver Ames, the president of the company, were invariably to obtain the best line the country afforded, regardless of the expense. Oakes Ames once wrote me, when it seemed almost impossible to raise money to meet our expenditures:

> Go ahead; the work shall not stop, even if it takes the shovel shop.

The Ameses were manufacturers of shovels and tools, and their fortunes were invested in that business; and, as we all know, the shovel shop went. When the day came that the business of the Ameses should go or the Union Pacific, Oakes Ames said:

> Save the credit of the road; I will fail.

It took a man of courage and patriotism to make that decision and lay down a reputation and business credit that was invaluable in New England, and one that had come down through almost a century. To him it was worse than death; and it was the blow given by the action of Congress which, followed by others, put him in his grave.

In February, 1875, Mr. Jay Gould, who had become heavily interested in the Union Pacific Railway, in connection with Messrs. Ames, Dillon, and the board of directors, conceived a plan of paying to the Government in addition to the sum it was then receiving from the company a sum of money each year that should be used as a sinking fund, which, at the maturity of the government bond, would liquidate that indebtedness. The Hon. James F. Wilson, of Iowa, a government director, and myself were selected to go to Washington to present the matter to the Government. General Grant was then President, and Gen. Benjamin F. Bristow Secretary of the Treasury. We presented the proposition to General Grant, who looked upon it favorably and referred it to the Secretary of the Treasury for the purpose of having a bill drawn which would carry out our views. The entire Cabinet was in favor of the proposition with the single exception of Mr. Jewell, of Connecticut. Upon the report of General Bristow, General Grant drafted a message to the Congress of the United States, recommending the passage of an act that would carry out this plan.

In the meantime rumors of what we were doing had reached New York, where there was a large short interest in the stock of the Union Pacific. This interest immediately gathered its forces and influence and sent persons to Washington to represent to the President that the proposed action of the Union Pacific was a mere stock-jobbing scheme for the purpose of twisting the shorts on Union Pacific stock, and their representations made such an impression on General Grant that he never sent his message in, and the company, receiving the treatment it did, then abandoned for the time all efforts to make a settlement with the Government. General Grant often said to me in later years that he regretted he did not settle the matter at that time. This demonstrates that at the moment the Union Pacific began to be prosperous the men who put their money in it and built it made the first effort to pay the debt due the Government at or before its maturity. If their offer had been accepted the earnings of the company demonstrated that they would have been able to have met their agreement, and at the maturity of the debt it would have been paid. This is one of the many instances in which the Union Pacific Railway has endeavored to fulfill, not only in letter, but in spirit, every obligation it owed to the Government, and I undertake to say that the Government of the United States, from the time the road was finally completed and in continuous operation, has never fulfilled any one of its obligations to the company, except the simple giving of its credit at the time of the building by the issue of its bonds.

How well our work was performed is shown by the reports of the distinguished commissions appointed by the Government to examine the road during its construction and after its completion.

Commissioners Horace Walbridge, S. M. Felton, C. B. Comstock, E. F. Winslow, and J. F. Boyd examined the road in 1869 to ascertain the sum of money that was necessary to complete the road under the government specifications, and the sum found necessary on the Union Pacific was $1,586,100, and on the Central Pacific $576,650. The amount required on the Union Pacific was only about one-half as much as the chief engineer of that road had found necessary to complete the road under the company's own specifications, and the company not only spent this, but a much larger sum in the work.

The last commission, composed of Maj. Gen. G. K. Warren, U. S. Army; J. Blickensderfer, jr., and James Barnes, civil engineers, concluded their report in part, as follows:

> The foregoing shows that the location of the Union Pacific Railway is in accordance with the law, and as a whole and in its different parts the most direct, central, and practicable that would be found from Omaha to the head of Great Salt Lake. Taken as a whole, the Union Pacific Railway has been well constructed. The energy and perseverance with which the work has been urged forward, and the rapidity with which it has been executed, was without parallel in history. In grandeur and magnitude of the undertaking it has never been equaled, and the country has reason to congratulate itself upon this great work of national importance so rapidly approaching completion under such favorable auspices.

When the Canadian government determined to build a Pacific railway, they had the Union Pacific examined, and after that examination they provided in their contracts that the Canadian Pacific should be built upon the Union Pacific standards, and when completed should be in its location and construction equal to it, thus paying a high compliment to the builders of the Union Pacific, and after the completion of the Canadian Pacific Railway, engineers of the Union Pacific were selected to examine that road to determine if its construction was up to the standard required.

The Blickensderfer and Clement report made a comparative analysis of the Union Pacific and Central Pacific, their location, construction, grade, curvature, etc., giving to the Union Pacific credit for being superior in most of these matters. The last and most critical examination of the location, grades, etc., came within the last three years, when under the reorganized company it was determined to reduce the grades to a maximum of 47 feet going east or west except at two points, the 80-foot grade at Cheyenne going west, and the 80-foot grade at the head of Echo Canyon going east.

The president of the Union Pacific, Mr. E. H. Harriman, at a banquet in Denver in 1904 stated that after the three years' examination, and the expenditure of $15,000,000 to $20,000,000 to change the grades to a maximum of 47 feet to the mile, it had been demonstrated that not a mile of road had been built to increase the distance and obtain subsidies; that the location and construction was a credit to the engineers and executive officers who built the road.

Mr. J. B. Berry, chief engineer of the Union Pacific Railroad, who had charge of the changes, pays this tribute to the engineers of the road:

> It may appear to those unfamiliar with the character of the country that the great saving in distance and reduction of grade would stand as a criticism of the work of the pioneer engineers who made the original location of the road. Such is not the case. The changes made have been expensive and could be warranted only by the volume of traffic handled at the present day. Too much credit can not be given Gen. G. M. Dodge and his assistants. They studied their task thoroughly and performed it well. Limited by law to a maximum gradient of 116 feet to the mile, not compensated for curvature, they held it down to about 90 feet per mile. Taking into consideration the existing conditions thirty-five years ago, lack of maps of the country, hostility of the Indians, which made United States troops necessary for protection of surveying parties, difficult transportation, excessive cost of labor, uncertainty as to probable volume of traffic, limited amount of money and necessity to get the road built as soon as possible, it can be said, with all our present knowledge of the topography of the country, that the line was located with very great skill.

The principal changes made by the Union Pacific Railroad since 1900 was, first, the change from the Muddy Creek line out of Omaha to the original Dey line, now known as the Lane cut-off, which saves 11 miles in 14 miles distance. The next is the line from Sherman to the Laramie plains, where by long tunnels and heavy work the grade is reduced from 90 feet to 47 feet maximum. The third change is the Cooper Lake line, which is changed from Rock Creek and Medicine Bow to near the original location of the Union Pacific, with a saving of 20 miles in distance. This is the change made when the line was building by the contractors against the protest of the chief engineer of the road and caused Generals Grant and Sherman to come to Fort Sanders for a conference. The fourth change was on the Central Pacific road from Ogden across Bear Creek, arm of Salt Lake, known as Lucien cut-off, saving 50 miles in distance and avoiding the heavy grades over Promontory Point. The original survey of the Union Pacific was from Ogden across Bear Creek, arm of Salt Lake, to south end of Promontory Point, but, as stated in another part of this paper, was abandoned because of the 12 feet of higher water in the lake in 1869, when the line was built, than in 1900, when the change was made. I understand the lake has been rising about 1 foot a year since this cut-off was completed. In a letter which I received from Mr. James R. Maxwell, assistant engineer, he makes the following statement of the result of their survey in 1867:

> The boat we used in sounding the lake was made of inch boards and not calked very well, and the heavy water soon shook the calking out of the bottom, and it did seem for a short time that we would have to take to the water. That was on our way back from Promontory Point to Mud Island. After we landed the topographer told me that he could not swim; if I had known that he would not have been on the boat. When I found 22 feet of water where Captain Stansbury had only 10 I knew that that line was not feasible then. I was told by a Mormon bishop that on two occasions the annual rise was 6 feet above any previous record and that it remained so, covering thousands of acres of farming land at northeastern side of the lake.

This part of the lake that was sounded by this party was east of Promontory Point. The water to the west of Promontory Point being twice as deep as that toward the east, therefore it was impossible for us with our means to build a railroad across the lake and we were forced around the north end of the lake and over Promontory Point.

The first surveys of the Union Pacific Railway were made in the fall of 1853. The first grading was done in the fall of 1864. The first rail was laid in July, 1865. Two hundred and sixty miles were built in 1866, 240 in 1867, including the ascent of the first range of mountains to an elevation of 8,235 feet above sea level, and from April 1, 1868, to May 10, 1869, 555 miles of road was built, all exclusive of temporary track and sidings, of which over 180 miles was built in addition, all at an approximate cost in cash of about $54,000,000.

Of late years there has been a great deal of criticism and comparison of the building of the Union Pacific and Central Pacific railroads, favoring the latter. The theory is that because the Central Pacific had the Sierra Nevada Range to tackle at first, it was a more difficult problem financially and physically to handle than the Union Pacific end, but this is a very great mistake. The Union Pacific had to bring all of its material, ties, bridging, etc., from tide water by rail or by river. They had to build the first 630 miles without any material on its line to aid them except the earth, and for this they only received $16,000 per mile in government bonds. There was no settlement on the line to create any traffic or earnings along the whole distance, which was very difficult in appealing to the people to buy the bonds and furnish money for the company. In comparison to this, the Central Pacific started at Sacramento with a tide-water base coming right up to it, so that all the material that had to come from foreign or domestic ports had the cheapest rates by sea. Then from Sacramento they had built over the mountains to Virginia City to the great Bonanza mines at Virginia City, which gave them a large traffic at high rates, and gave them very large earnings. Then, again, only a few miles east of Sacramento, the east base of the Sierra Nevada Range commences, and they received immediately $48,000 in government bonds per mile for the 150 miles, and $32,000 in government bonds from there on to Salt Lake, a distance of barely 200 miles, more than the 630 miles that the Union Pacific had to build on $16,000 per mile. This favorable condition for the Central Pacific was such that the representatives of that road had very little difficulty in raising all the money they needed and having for nearly one-half of their road a fine traffic to help pay the interest on their bonds.

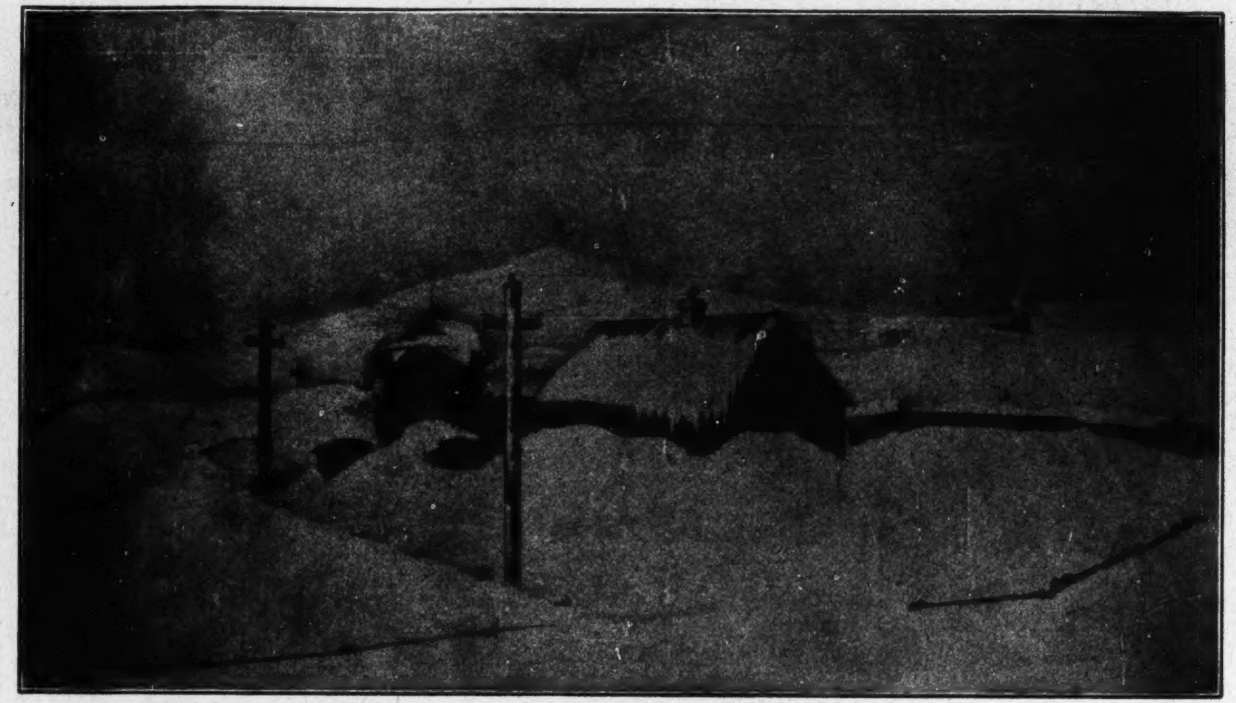
I do not speak of this in criticism of the work of the Central Pacific, which was remarkable, and like that of the Union Pacific, has never been excelled, but only in comparison of the difficulties the two companies had to overcome. I am not surprised that some of the public should take this view of the matter when the later literature of the Union Pacific seems to take the same view and devote what praise it has to the work of the men who built the Central Pacific, overlooking almost entirely the struggles of those who initiated the work on the line of the Union Pacific and who furnished the funds to explore the country and determine the feasibility of the route and stood by it for nearly twelve years before the Central Pacific was thought of. The fact is, the Central Pacific obtained no right and did not think of going east of the California state line until after the laws of 1865 and 1866 had been enacted, which gave them the right to come east of the state line of California and made them a part of the transcontinental line.

The operation of the road the first winter, 1869–70, gave us a test of what we might expect from the snow. In building the road, we studied the mountains to get our lines upon the slopes that were the least exposed to heavy snows and slides, but we had no means of fighting the snows in the Laramie Plains except by fences and sheds, and none were put up until the year 1870, so that when the heavy snows fell in the winter of 1869–70 it caught six of our trains west of Laramie that were snowed in there some weeks. As a precaution in starting our trains from Omaha, we put on a box car with a stove in it and loaded with provisions, so as to meet any emergency. These six trains that were caught in the snow between Laramie and the divide of the continent had these supplies and also were supplied with sledges and snowshoes from Laramie. They had with them, in charge of the six trains, Mr. H. M. Hoxie, the assistant superintendent, who managed to get the trains together, but the blizzards were so many and so fierce that it was impossible for men to work out in the open, and even when they cleared the cuts ahead they would fill up before they could get the trains through them. Probably that winter's experience with snow was the worst the Union Pacific has ever experienced, but Mr. Hoxie handled his forces with great ability and fed and entertained his passengers in good shape. In one train was an opera company bound for California that Mr. Hoxie used to entertain the passengers with, so that when the trains reached Salt Lake City the passengers held a meeting and passed resolutions complimentary to Mr. Hoxie and the Union Pacific in bringing them safely through. A photograph of the trains was taken at the time they were snowed in near Cooper Lake, and a print of it is here reproduced.

I can not conclude this description of the building of the Union Pacific Railway better than quoting my conclusions, as stated in my final report, sent to the company and the United States Government on December 1, 1869. It is as follows:

"In 1853 Henry Farnam and T. C. Durant, the then contractors and builders of the Missouri River Railroad in Iowa, instructed Peter A. Dey to investigate the question of the proper point for the Mississippi and Missouri River road to strike the Missouri River to obtain a good connection with any road that might be built across the continent. I was assigned to the duty, and surveys were accordingly extended to and up the Platte Valley, to ascertain whether any road built on the central or then northern line would, from the formation of the country, follow the Platte and its tributaries over the plains, and thus overcome the Rocky Mountains. Subsequently, under the patronage of Mr. Farnam, I extended the examination westward to the eastern base of the Rocky Mountains and beyond, examining the practicable passes from the Sangre Christo to the South Pass; made maps of the country, and developed it as thoroughly as could be done without making purely instrumental surveys. The practicability of the route, the singular formation of the country between Long's Peak, the Medicine Bow Mountains, and Bridger Pass, on the south, and Laramie Peak and the Sweetwater and Wind River ranges on the north, demonstrated to me that through this region the road must eventually be built. I reported the facts to Mr. Farnam, and through his and his friends' efforts, the prospect for a Pacific railroad began to take shape.

"In after years, when the war demonstrated the road to be a military necessity, and the Government gave its aid in such munificent grants, surveys were extended through the country previously explored, its resources developed, its hidden treasures brought to light, and its capabilities for the building of a railway to the Pacific fully demonstrated.



SIX PASSENGER TRAINS SNOWED IN ON THE LARAMIE PLAINS.
Union Pacific Railway, winter of 1869-70.

"In doing this over the country extending from the Missouri River to the California state line, and covering a width of 200 miles, north and south, and on the general direction of the forty-second parallel of latitude, some 15,000 miles of instrumental lines have been run, and over 25,000 miles of reconnoissances made.

"In 1863 and 1864, surveys were inaugurated, but in 1866 the country was systematically occupied; and day and night, summer and winter, the explorations were pushed forward through dangers and hardships that very few at this day appreciate, for every mile had to be run within range of the musket, as there was not a moment's security. In making the surveys numbers of our men, some of them the ablest and most promising, were killed; and during the construction our stock was run off by the hundred, I might say, by the thousand, and as one difficulty after another arose and was overcome, both in the engineering and running and constructing departments, a new era in railroad building was inaugurated.

"Each day taught us lessons by which we profited for the next, and our advances and improvements in the art of railway construction were marked by the progress of the work, 40 miles of track having been laid in 1865, 260 in 1866, 240 in 1867, including the ascent to the summit of the Rocky Mountains, at an elevation of 8,235 feet above the ocean; and during 1868, and to May 10, 1869, 555 miles, all exclusive of side and temporary tracks, of which over 180 miles were built in addition.

"The first grading was done in the autumn of 1864, and the first rail laid in July, 1865. When you look back to the beginning at the Missouri River, with no railway communication from the East, and 500 miles of the country in advance without timber, fuel, or any material whatever from which to build or maintain a road, except the sand for the bare roadbed itself, with everything to be transported, and that by teams or at best by steamboats, for hundreds and thousands of miles; everything to be created, with labor scarce and high, you can all look back upon the work with satisfaction and ask, Under such circumstances could we have done more or better?

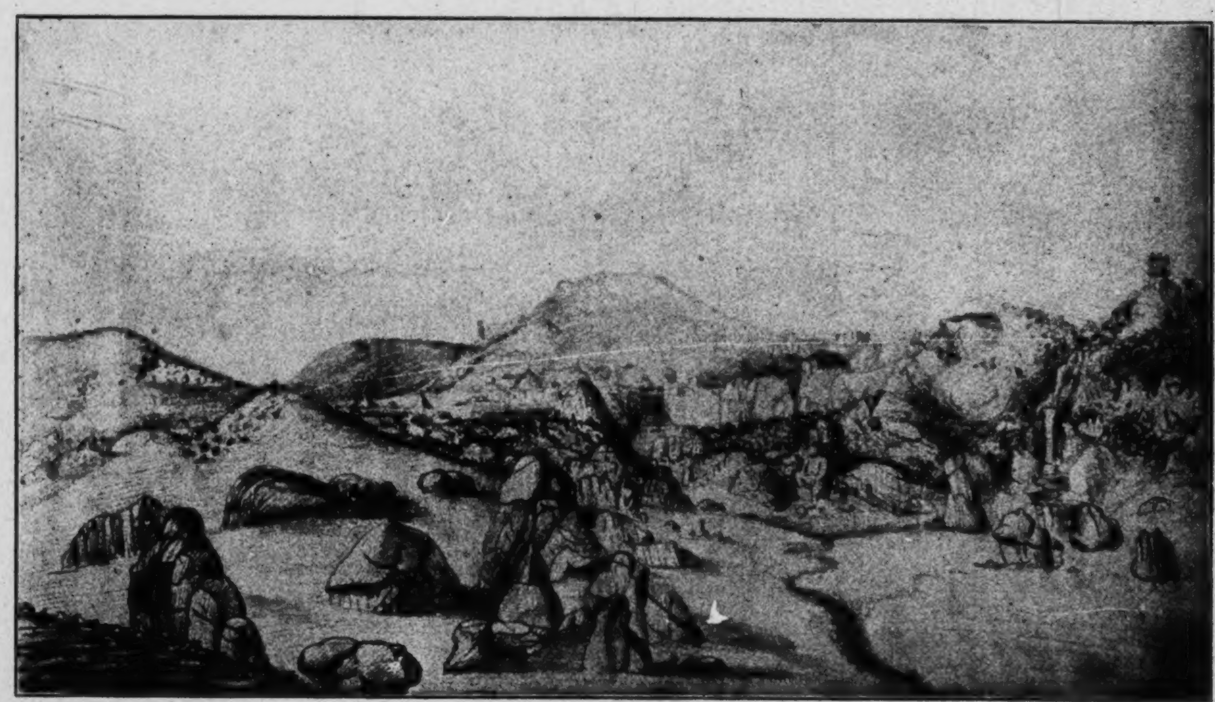
"The country is evidently satisfied that you accomplished wonders, and have achieved a work that will be a monument to your energy, your ability, and to your devotion to the enterprise through all its gloomy as well as its bright periods, for it is notorious that notwithstanding the aid of the Government there was so little faith in the enterprise that its dark days—when your private fortunes and your all was staked on the success of the project—far exceeded those of sunshine, faith, and confidence.

"This lack of confidence in the project, even in the West, in those localities where the benefits of its construction were manifest, was excessive, and it will be remembered that laborers even demanded their pay before they would perform their day's work, so little faith had they in the payment of their wages, or in the ability of the company to succeed in their efforts. Probably no enterprise in the world has been so maligned, misrepresented, and criticised as this; but now, after the calm judgment of the American people is brought to bear upon it, unprejudiced and unbiased, it is almost without exception pronounced the best new road in the United States.

"Its location has been critically examined, and although the route was in a comparatively short time determined upon, as compared with that devoted to other similar projects, yet, in regard to the correctness of the general route, no question is ever raised; and even in the details of its location, 730 miles of which were done in less than six months, it has received the praise of some of the ablest engineers of the country. Its defects are minor ones, easily remedied, and all the various commissions, some of them composed of able and noted engineers, have given the company due credit in this particular, although they may have attacked it in others, and to-day, as in the past, the company need fear no fair, impartial criticism upon it or no examination made by men of ability and integrity or such as are masters of their profession.

"That it yet needs work to finally complete it no one denies, but whatever is necessary has been or is being done.

"Its future is fraught with great good. It will develop a waste, will bind together the two extremes of the nation as one, will stimulate intercourse and trade and bring harmony, prosperity, and wealth to the two coasts. A proper policy, systematically and persistently followed, will bring to the road the trade of the two oceans, and will give it all the business it can accommodate, while the local trade will increase gradually until the mining, grazing, and agricultural regions through which it passes will build up and create a business that will be a lasting and permanent support to the country."



CITY OF ROCKS.

Northwest of Salt Lake, on Union Pacific Railway survey to Oregon, 1868.

ADDRESS AT THE OMAHA CENTENNIAL.

I have been asked to give ten minutes to the construction of the Union Pacific Railway. Private enterprise made the explorations, determined the line, and built the Union Pacific Railway. Although the Government spent an immense sum in surveying three other routes it did not touch the most feasible route, that of the forty-second parallel.

In 1852 Farnam and Durant were building the Mississippi and Misouri road, now the Rock Island. They desired to end that line of the Missouri River where the Pacific Railroad, following the continent forty-second parallel of latitude, would commence. Under the direction of Peter A. Dey, who was then the chief engineer of that line, I made the first survey across the State of Iowa, and the first reconnoissances and surveys on the Union Pacific for the purpose of determining where the one would end and the other commence, on the Missouri River. I crossed the Missouri River in the fall of 1853 and made our explorations west to the Platte Valley and up it far enough to determine that it would be the route of the Pacific road.

The party that I crossed the Missouri River with had never come in contact with the Indians. We were tenderfeet, and the Omahas were very free with what we had until I had to use drastic measures to stop them. I went on to the Elkhorn River ahead of my party. They stole my horse, but I got him back, so that our initiation into Nebraska was not a very creditable one.

I continued these reconnoissances from 1853 on and off until 1861 under the private patronage of Mr. Henry Farnam, and we also during that time commenced work on the M. & M. road in Council Bluffs and graded it several miles east, fixing its location permanently on the Missouri River. The reconnoissances made by me during all this time, with the information that I obtained from the Mormons and the fur traders and travelers through the country, determined the general route of the Union Pacific road as far west as Salt Lake, and virtually beyond that to the California state line.

In 1862 the Union Pacific Railway was organized at Chicago, and soon after Mr. Peter A. Dey continued the explorations, and in 1863 he placed parties over the Black Hills and in Salt Lake and over the Wasatch in Utah. In 1863 I was on duty at Corinth, when I was called to Washington by Mr. Lincoln, who had met me in 1859 at

Council Bluffs and had questioned me very systematically as to the knowledge I had of the western country and the explorations I had made there. Remembering this, he called me to Washington to consult with me as to where the eastern terminus of the Union Pacific Railway should be. I explained to him what my surveys had determined, and he fixed the initial point of the Union Pacific, as you all know, on the western line of Iowa opposite this city. At this interview with Mr. Lincoln he was very anxious to have the road constructed. It was my opinion then that it could not be constructed unless it was built by the Government, and I so informed Mr. Lincoln. He said that the United States had at that time all it could handle, but it was ready to make any concession and obtain any legislation that private parties who would undertake the work would require.

I then went to New York City and met Mr. Durant and others connected with the Union Pacific and informed them of what Mr. Lincoln had said. It gave them new hope and they immediately formulated the amendments to the law of 1862, which was passed in 1864 and enabled them to push the work.

The ground was broken here in Omaha in December of 1863, and in 1864 about $500,000 was spent in surveying and construction, and in 1865 40 miles of road was completed to Fremont. Mr. Dey, who had charge of the work up to this time as chief engineer, resigned, and stated in his letter that he was giving up the best position in his profession this country had ever offered to any man.

In May, 1866, I resigned from the army, came to Omaha and took charge of the work as chief engineer, and covered the line with engineering parties from Omaha to California, and pushed our location up the Platte Valley.

In 1866 we built 260 miles. In the winter of 1866 we planned to build the next year 288 miles to Fort Sanders. As our work had to all be done under the protection of the military, I was continually in communication with General Sherman, who was then the commander of this department, and confidentially gave him our plans as fast as they were settled upon.

In January, 1867, I wrote him a letter, showing him what we proposed to do in that year, and he answered it from St. Louis on January, 1867, saying:

> I have just read with intense interest your letter of the 14th. Although you wanted me to keep it to myself, I believe you will sanction my sending it to General Grant for his individual perusal, to be returned to me. It is almost a miracle to grasp your proposition to finish to Fort Sanders this year, but you have done so much that I mistrust my own judgment and accept yours.

During 1867 we reached the summit of the Black Hills and wintered at Cheyenne, where the population of nearly 10,000 gathered around us.

In November, 1867, the Northwestern Railway was completed at Council Bluffs. Up to this time the amount of road we built each year was limited to the material that we could bring up the Missouri River on steamboats during about three months' navigation. Reaching the Black Hills also took us into the timber country, where we could obtain ties within 25 or 50 miles from the line. It was then planned, during the winter of 1867, to build as far west as possible, and we laid out plans to reach Ogden, giving us 500 or more miles to build. In estimating the extra cost of building this 500 miles, which crossed two ranges of mountains, within a year, I informed the company that it would be at least ten millions of dollars. Their answer was to go ahead, no matter what it cost.

During the winter of 1867 we accumulated at Cheyenne all the material possible, having the Northwestern to bring it to us, and we made every preparation to start our work by the 1st of April. When you consider that material for a mile of road required 40 cars, besides the necessary cars for supplies and for the population that was along the line of the road, you can imagine what it was to supply the material at the end of the line, which, on an average, had to be about 800 miles, but Snyder and Hoxie, of the operating department, grasped the situation and solved the problem. We reached Ogden in the spring of 1869, and Promontory Point on May 10, 1869. During the winter of '68 the grading was done over the Wasatch Mountains, and the earth was blasted there the same as rock. Our track was laid on icy banks. I saw one of the construction trains slide off of the bank bodily into the ditch, loaded with material.

From the 1st day of April, 1868, until May 10, 1869, only thirteen months, we built and laid track of 555 miles of road and graded the line to Humboldt Wells, making the total distance covered by our force 726 miles, and transported all the material and supplies from the Missouri River. When you consider that not a mile of this division of the road had been located until April, that we covered in that year over 700 miles of road, bringing all the material from the Missouri River, that we had to overcome its two great physical obstacles, two ranges of mountains, it was a task never equaled then nor surpassed since. It could not have been accomplished had it not been for the experience of the chiefs of the departments in the civil war.

The commission appointed by the Government to examine the work says:

> Taken as a whole, the Union Pacific Railway has been well constructed. The energy and perseverance with which the work has been urged forward and the rapidity with which it has been executed was without parallel in history. In grandeur and magnitude of the undertaking, it has never been equaled.

It is impossible for me in the short time I have to speak individually of the persons who took a prominent part in the construction of the line, but they entered into the work all with one spirit. They worked from daylight till dark, and when necessary on Sundays, and it was an esprit de corps and a determination from the head to the foot of everyone to accomplish the task set before them.

The Indians were very hostile, often attacking us. I lost two of my chiefs and many of the men and any quantity of stock. That failed to stop us, but if it had not been for the cordial support of Generals Grant and Sherman and the officers of the army along our lines we would not have succeeded.

When our track was finished to Promontory, there assembled there the officials from the east and from the west. The engineers of the two lines ran their locomotives together, each breaking a bottle of champagne upon the other's engine, and when the last spike was driven and the telegraph ticked all over the world the completion of the first transcontinental line across our Continent, I did not forget to telegraph to my old chief, General Sherman, who had taken such a great interest in the work, and received from him this dispatch:

> In common with millions, I sat yesterday and heard the mystic taps of the telegraphic battery announce the nailing of the last spike in the great Pacific road. Indeed, am I its friend? Yes. Yet am I a part of it, for as early as 1854 I was vice-president of the effort begun in San Francisco under the contract of Robinson, Seymour & Co. As soon as General Thomas makes certain preliminary inspections in his new command on the Pacific, I will go out, and, I need not say, will have different facilities from that of 1846, when the only way to California was by sail around Cape Horn, taking our ships 196 days. All honor to you, to Durant, and Jack and Dan Casement, to Reed, and the thousands of brave fellows who have wrought out this glorious problem, in spite of changes, storms, and even doubts of the incredulous, and all the obstacles you have now happily surmounted.
>
> W. T. Sherman, *General.*

The rapidity of the building of the Union Pacific Railway caused many comments and often assertions that the road was not thoroughly built, that to make distance and thereby receive more bonds we unnecessarily increased the length of the road; that to save work we often used the maximum grade, and other and similar criticisms. The best answer to that has been made in the last three years. The Union Pacific Railway, under a very able engineer, Mr. Berry, has been engaged in reducing the grades of the road, except over the two mountain ranges, to a maximum of 47 feet per mile. It has decreased the curvature and shortened the line about 37 miles. To obtain this it has cost the Union Pacific Railroad Company nearly one-third the total cash cost of building the road. Mr. Berry, in his report upon these changes, pays this high compliment to those connected with the location and construction of the road:

> It may appear to those unfamiliar with the character of the country that the great saving in distance and reduction of grade would stand as a criticism of the work of the pioneer engineers who made the original location of the railroad. Such is not the case. The changes made have been expensive, and could be warranted only by the volume of traffic handled at the present day. Too much credit can not be given Gen. G. M. Dodge and his assistants. They studied their task thoroughly and performed it well. Limited by law to a maximum gradient of 116 feet to the mile, not compensated for curvature, they held it down to about 90 feet per mile. Taking into consideration the existing conditions thirty-five years ago, lack of maps of the country, hostility of the Indians, which made United States troops necessary for protection of surveying parties, difficult transportation, excessive cost of labor, uncertainty as to probable volume of traffic, limited amount of money, and necessity to get road built soon as possible, it can be said with all our present knowledge of the topography of the country that the line was located with very great skill.

TWIN MONKS.

On Union Pacific Railway survey to Portland, Oregon, 1868.

THE BUILDING OF THE UNION PACIFIC RAILROAD AND ITS RELATION TO COUNCIL BLUFFS AND WESTERN IOWA.

To give the early history of the Union Pacific Railway and its relations to Council Bluffs and western Iowa necessitates the recital of the first railway surveys in Iowa.

In 1852 the M. & M., now the Council Bluffs, Rock Island and Pacific Railway, was chartered in the interest and as an extension of the Chicago and Rock Island Railway, which was completed that year to the Mississippi River at Rock Island.

In May, 1853, Peter A. Dey left the Rock Island, of which he was a division engineer, stationed at Tiskilwa, and commenced at Davenport, Iowa, the first survey of a railroad line across the State of Iowa. I had been with Mr. Dey about eight months, as rod man, and under his direction had made a survey of the Peoria and Bureau Valley Railway in Illinois. Mr. Dey was made chief engineer of the M. & M., and took me to Iowa as assistant, and placed me in charge of the party in the field—certainly a very fine promotion for the limited experience I had had—and it is one of the greatest satisfactions and pleasures of my life to have had his friendship from the time I entered his service until now. Mr. Dey is not only a very distinguished citizen of Iowa, but is one of the most distinguished engineers of the country. He was known for his great ability, his uprightness, and the square deal he gave every one, and he has greatly honored this State in the many public positions he has held. I look back upon my services with him with the greatest pleasure. My practical experience under him and the confidence he placed in me were of incalculable benefit to me, and the example he set us has lasted me through my life, and I shall always honor, respect, and hold him in the highest consideration and friendship.

We completed a survey and location to Iowa City in August, 1853. Early in September we commenced the survey across Iowa, passing through Marengo, Newton, Des Moines, and reaching Council Bluffs December 1, 1853, this being the first railway survey across the State. Now commenced our first reconnoissances for the Union Pacific Railway. We crossed the river by flat-boat and extended our lines west to the Platte Valley, and determined definitely the feasibility of a connection with the great Platte route with roads in Iowa terminating at or near Council Bluffs. It is a singular fact that the Government in 1853 authorized the exploration of the country west of the Missouri River to the Pacific on four different routes, but made no mention of the most feasible route, and the one that was first built upon, known as the forty-second parallel or Great Platte route. A well-defined trail of this route was first made by the buffalo and the Indians, followed by the fur traders and trappers, then used by the Mormons to Salt Lake. Following them came the great overland emigration to California and Oregon, and on this trail and road, or close to them, was built the Union Pacific and Central Pacific to California, and the Short Line branch of the Union Pacific to Oregon.

In our surveys to the Missouri River, Cook and Sargent, who were representatives of the M. & M. Railway in Iowa, held large interests at Florence, Nebr., and were anxious that our line should terminate on the Missouri River opposite that point. It was also stated that the Missouri River at that point had rock bottom. To solve this question we ran two lines, one down Pigeon Creek and one down Mosquito, and as the latter was superior in an engineering point of view, Mr. Dey adopted that line. There was considerable opposition to it, but his recommendation stood. The question of terminus was so often discussed, and as the Bluffs people felt so uncertain as to the final result, they proposed that Pottawattamie County should vote $300,000 in bonds in aid of the road if the company would commence work at the Bluffs, make it the terminus and spend that money in building east through Pottawattamie County. This proposition was submitted to Messrs. Farnam and Durant, and accepted. The bonds were voted and the money raised, and it was spent in grading a portion of the road in Pottawattamie County, but the failure of the M. & M. Company in 1857 stopped work here, as well as on the rest of the line in the State. The Rock Island, the successor of the M. & M., occupied the line graded in this county when it was built.

In the fall of 1854 work was suspended on the M. & M. road in Iowa, and I moved to the Bluffs, and under the patronage of Henry Farnam continued the explorations west for the Union Pacific by getting all the information I could from the Indians and fur traders and Mormons of the country we were finally to occupy, until the general route of the Union Pacific to the Pacific Ocean was pretty fully settled in our own minds.

There was keen competition in the fifties for the control of the vast immigration crossing the plains, and Kansas City, Fort Leavenworth, St. Joe, and Council Bluffs were points of concentration on the Missouri River. The trails from all these points led to and converged in the Platte Valley at Kearney and east of it. A southern trail led from Kansas City up the Arkansas to New Mexico and on to the Pacific by the southern route, but was not much traveled west of New Mexico.

From my explorations and the information I had obtained I mapped and made an itinerary of the whole Platte Valley route to Utah, California, and Oregon, giving the camping places for each night, showing where wood, grass, and water could be found, pointing out where the fords of the different streams could be found, and giving such other information as would be valuable to immigrants. The interests centering around Council Bluffs printed this map and itinerary and sent it broadcast through the Western States, and it had no small influence in turning the mass of overland immigration to the Great Platte route. This route was up that river to its forks, and then either up the north or south fork to Salt Lake, thence to California by the Humboldt and Truckee valleys, branching at South Pass or Fort Bridger to Snake River and by that and the Columbia River valleys to Oregon.

Both Mr. Dey and myself returned to Iowa City during the summer of 1856 to continue the construction of the M. & M. road, and made everything ready for the work, when the panic of 1857 involved Mr. Farnam financially, caused by Mr. Durant pledging the paper of the firm of Durant & Farnam to meet his speculative ventures. This involved Mr. Farnam's collateral in litigation, which it took several years to unravel, and Mr. Durant's connection with the M. & M. contract was fatal to the early completion of that line of railway, and Mr. Farnam took no further interest in the project.

I returned to Council Bluffs and continued my examinations until 1861. I remember that in 1859, when I returned from a trip on the plains, I met Mr. Lincoln at the Pacific House. Mr. Lincoln came up from St. Joseph on a steamer to look after an interest he had bought in the Riddle tract from N. B. Judd, of Chicago. He also found here and visited some old Springfield (Ill.) friends, W. H. M. Pusey, Thomas Officer, and others. Mr. Lincoln sought me out, and was greatly interested in the project of the Pacific Railroad, and I gave him all the information I had, going fully and thoroughly into it. I was very decided that the Great Platte route was, from our explorations and surveys, the best, most feasible, and far superior to any of the routes explored by the Government.

In 1836 the first public meeting to consider the project of a Pacific railway was called by John Plumbe, a civil engineer of Dubuque, Iowa. Interest in a Pacific railway grew from this time, the exploration of Fremont in 1842 and 1846 brought the attention of Congress, and A. C. Whitney was zealous and efficient in the cause from 1840 to 1850. The first practical measure was Senator Salmon P. Chase's bill in 1853, making an appropriation for the explorations of different routes for a Pacific railway. Numerous bills were introduced in Congress between 1852 and 1860, granting subsidies and lands, and some of them appropriating as large a sum as $96,000,000 for the construction of the road. One of these bills passed one of the houses of Congress.

The results of the explorations ordered by Congress were printed in eleven large volumes covering the country between the thirty-second and forty-ninth parallels of latitude, and demonstrated the feasibility of building a Pacific railway, but at a cost on any one of the lines much larger than the Union Pacific and Central Pacific were built for. It is a singular fact that in all these explorations the most feasible line in an engineering and commercial point of view, the line with the least obstacles to overcome, of lowest grades and least curvature, was never explored and reported on. Private enterprise explored and developed that line along the forty-second parallel of latitude.

In 1861 Gen. S. R. Curtis, of Iowa, reported for the Pacific Railway Committee of Congress the first Pacific railroad act, and Senator Harlan, of Iowa, finally succeeded in making it a law; and in March, 1862, the company was organized. On September 2, 1862, Henry B. Ogden, of Chicago, was made president, Thomas M. Olcott, vice-president, and H. V. Poor, secretary. In August, 1863, T. C. Durant sent Peter A. Dey to examine the passes over the Black Hills and Wasatch Range.

On October 30, 1863, Mr. Durant, in his report to the board, stated that the explorations formerly made by Gen. G. M. Dodge and those made by Mr. Dey proved of great value. Mr. Dey at this meeting submitted the report of his reconnoissances, and the company placed him in charge of all the surveys, with instructions to develop the line through to Salt Lake City. Mr. Dey took into the field parties headed by B. B. Brayton, S. B. Reed, F. M. Case, Joseph A. Young, son of President Brigham Young, and soon determined that the general route we had originally reported upon was the one to be built upon.

The law of 1862 did not bring the results hoped for. No money could be raised under its provisions, and the only result was the series of explorations made in 1863, and the breaking of ground at Omaha on December 21 of that year.

In 1863, I think about June, while in command at Corinth, Miss., I received an order to report in Washington, and was informed that the President wished to see me. I had no idea what the President could wish to see me about—in fact, was a good deal puzzled at the order. When I reached Washington and called on the President, I found that he desired to consult me upon the proper place for the initial point of the Union Pacific, and that he had not forgotten his conversation with me in 1859.

The towns on the Missouri River within a distance of 100 miles of the mouth of the Platte River were using their influence to have the terminus made at each one of their places, but it was evident that Mr. Lincoln had determined upon some point north of the mouth of the Platte River so that great valley could be utilized for the route of the railroad. After his interview with me, in which he showed a perfect knowledge of the question, and satisfying himself as to the engineering questions that had been raised, I was satisfied he would locate the terminus at or near Council Bluffs. He issued his first order on November 17, 1863. It was in his own language, and as follows:

> I, Abraham Lincoln, President of the United States, do hereby fix so much of the western boundary of the State of Iowa as lies between the north and south boundaries of the United States township within which the city of Omaha is situated as the point from which the line of railroad and telegraph in that section mentioned shall be constructed.

This description was not considered definite enough by the company, and on March 7, 1864, President Lincoln issued the second executive order, as follows:

> I, Abraham Lincoln, President of the United States, do, upon the application of said company, designate and establish such first-named point on the western boundary of the State of Iowa east of and opposite to the east line of section 10, in township 15, south of range 13, east of the sixth principal meridian in the Territory of Nebraska.

On March 8, 1864, he notified the United States Senate that on the 17th day of November, 1863, he had located the "eastern terminus of the Union Pacific Railway within the limits of the township in Iowa opposite to the town of Omaha." "Since then," he says, "the company has represented to me that upon added survey made it has determined upon the precise point of departure of the branch road from the Missouri River, and located same within the limits designated in the order of November last."

Mr. Lincoln also took up with me the construction of the road. I expressed opinion that no private enterprise could build it, and that it must be done by the Government. He answered that the Government had its hands full in the war, but was willing to support any company to the full extent of its power. After saying good-bye to the President, I went immediately to New York and saw Messrs. Durant, Cisco, and others then connected with the company and reported to them Mr. Lincoln's words. It gave new courage to the company. The law of 1864 was passed, and Mr. Dey let the first contracts, and grading was started in the fall of 1864.

After the location of the road at Council Bluffs, the first serious question threatening Council Bluffs was the change of Mr. Dey's line from Omaha to Elkhorn, adding 9 miles in distance, claiming to avoid heavy work and heavy grades. Many saw in this change, advocated by Colonel Seymour, the consulting engineer, and Mr. Durant, the vice-president of the Union Pacific, an intention of utilizing Bellevue instead of the Bluffs as the real terminus of the road, and this aroused not only Omaha, but the Bluffs with all the influence of Iowa against such a result.

The main argument for adding 9 miles of distance in 13 miles of road was that it eliminated the 80 and 66 foot grades of the direct line. If this had been done there would have been some argument for the changes, but they only eliminated the grades from the Omaha summit, which it took 3 miles of 60 and 66 foot grades to reach, and east of the Elkhorn summit, which was an 80-foot grade, so by the change and addition of 9 miles they made no reductions in the original grades or in the tonnage hauled in a train on the new line over the old line if it had been built.

The grades at Omaha and Elkhorn have been eliminated since 1900, and the new management is adopting the old Dey line for the distance it saves and in bringing the grade to the road's maximum of 47 feet to the mile. It was Mr. Dey's intention that, when traffic demanded the original short line, grades would be reduced to whatever maximum grade the road should finally adopt.

After a long contest and many reports the Government provided that the change should only be made if the Omaha and Elkhorn grades were eliminated, the first by a line running south from Omaha 2 miles in the Missouri Valley and cutting through the Bluffs to Muddy Creek, giving a 35-foot maximum grade, and the Elkhorn, by additional cutting and filling without changing the line; but this was never done. The company paid no attention to the decision, but built on the changed line, letting the grades at Omaha and Elkhorn stand, and the government commissioners accepted the road, ignoring the conditions of the change, and bonds were issued upon it, although it was a direct violation of the government order.

The final decision in favor of the change, and the ignoring of Mr. Dey's recommendations in letting the construction contracts, caused Mr. Dey to send in his resignation. He stated in his letter of resignation that he was giving up " the best position in his profession this country has offered to any man."

During the building of the road the question of bridging the Missouri River was under discussion, and continuous examinations of the river in sounding, watching currents, etc., was had. Three points were finally determined upon as most feasible. First, Child's Mill, which was a high bridge, the shortest, and reached Muddy Creek with 35-foot grade, avoiding the heavy 66-foot grade at Omaha. Second, Telegraph Pole, right where there was some rock bottom; this to be a low drawbridge, and third, the M. & M. crossing for a high bridge. The latter was decided upon, more especially to meet the views of Omaha and for aid that city gave the company.

We began work on the bridge in 1868 and continued it in 1869 and 1870, but the company found it impossible to continue, as they had no funds and they could not issue any securities under their charter to pay for the work. I was very anxious the bridge should be built to utilize the thousand acres of land I had bought for our terminals in Iowa and to fix permanently and practically the terminus in Iowa. The company proposed to me to organize a bridge company, to interest the Iowa roads terminating at the Bluffs, and ask authority from the Government to construct the bridge and issue securities upon it, the Union Pacific agreeing to use the bridge and make its terminals and connections with the Iowa roads on the Iowa side.

I saw all the Iowa roads. They agreed to give their aid, but made the condition that their connection with the Union Pacific should be on the Iowa side. I went to Washington, presented the bill, passed it through the House, and left it in Senator Harlan's hands to pass it in the Senate. This was very quietly done, but Omaha got alarmed; and Governor Saunders, who was a personal friend of Senator Harlan, took the matter up, and, I think, went to Washington. The Omaha people interested themselves in stirring up opposition in the Bluffs.

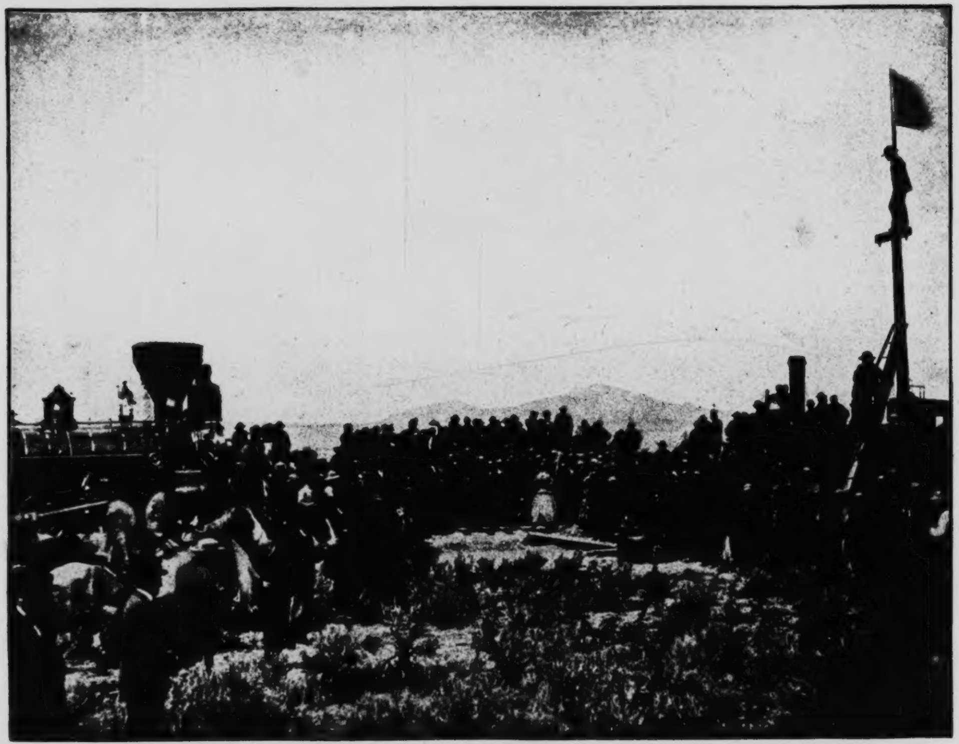
A public meeting was held at the corner of Broadway and Pearl streets, over which J. W. Crawford presided. I was very seriously criticised and the bridge scheme denounced, although it was entirely and solely in the interest of Council Bluffs and would have brought the terminus and business of the Union Pacific to the Bluffs, as they had entered into an agreement with the Iowa roads to that effect.

The public meeting was addressed in favor of the bridge by Messrs. Pusey, Officer, and myself, also by Caleb Baldwin, and was opposed by Messrs. James, Larimer, Montgomery, and others. The meeting passed resolutions asking our Senators to defeat the bridge bill. Harlan acted on this resolution and defeated the bill in the Senate and Saunders and Omaha accomplished their work.

The Union Pacific Company was greatly disgusted and disappointed, and dropped for the time all efforts to build a bridge. If the bill had passed, the bridge would have been built in the interests of Council Bluffs and the Iowa roads. The Union Pacific later on applied to Congress, which passed a bill authorizing the Union Pacific to build a bridge, issue bonds and stock upon it, and placed it entirely in their control; but the Union Pacific had no great interest in coming to Council Bluffs or Iowa and made their terminus at Omaha and forced the Iowa roads over the bridge until 1875, when the United States Supreme Court decided that the Union Pacific should be operated from Council Bluffs westward as a continuous line for all purposes of communication, travel, and transportation, and especially ordered them to start all through passenger and freight trains westward from the Bluffs.

This came too late to cure the mischief the town meeting had accomplished, as the Union Pacific had its interests centered in Omaha, and its offices, and the Iowa roads had made their contracts and gone there, and the Bluffs had only reaped the benefit of its terminal that the growth of business has forced to them, whereas, by law, by economy of operation, and by the ample terminals made to accommodate it, it should have been the actual terminus, and should have received full benefit of it, not only from traffic of the Union Pacific, but from the traffic and interest of the Iowa roads.

The points I have mentioned are the principal ones in the building of the Union Pacific that interest Council Bluffs. There were others, but my article is already too long. The building of the Union Pacific was of incalculable benefit to the Bluffs and Iowa. General Sherman said it advanced our country one hundred years. The rapidity of building was a factor. Forty miles of track was laid in 1865, 260 miles in 1866, 246 in 1867, including the ascent to the summit of the Black Hills at Sherman, 8,255 feet above the sea, and during 1868 and to May, 1869, 555 miles, all exclusive of 186 miles of sidings and all from one end, a task never before or since equaled.



JOINING OF TRACKS, PROMONTORY, UTAH.

Scene when the last spike holding the rails joining the Union Pacific and Central Pacific was driven.

FORTIETH ANNIVERSARY OF DRIVING OF THE LAST SPIKE ON THE UNION PACIFIC AND CENTRAL PACIFIC RAILWAY.

The building of a Pacific steam road to connect the streams flowing into the Atlantic and Pacific was advocated as early as 1819, before a mile of railroad was built in any part of the world. It took practical form when Asa Whitney, in 1845, in petitioning Congress in behalf of a Pacific railroad, said: "You will see that it will change the whole world." Senator Thomas H. Benton in 1849 pleaded that the great line when built should "be adorned with its crowning honor, the colossal statue of the great Columbus, whose design it accomplishes, hewn from the granite mass of a peak of the Rocky Mountains, overlooking the road, the mountain itself the pedestal, and the statue a part of the mountain, pointing with outstretched arm to the western horizon, and saying to the flying passenger, 'There is the East! There is India!'" Charles Sumner in 1853 said:

> The railroad from the Atlantic to the Pacific, traversing a whole continent and binding together two oceans, this mighty thoroughfare when completed will mark an epoch of human progress second only to that of our Declaration of Independence. May the day soon come!

And it did come, and all the prophecies were fulfilled when the first transcontinental line was completed and the tracks joined at Promontory Point, Utah, on May 10, 1869, just forty years ago.

This ceremony was one of peace and harmony between the Union Pacific, coming from the east, and the Central Pacific, coming from the west. For a year or more there had been great contention and rivalry between the two companies, the Union Pacific endeavoring to reach Humboldt Wells, on the west boundary of Utah, and the Central Pacific rushing to reach Ogden, Utah, to give them an outlet to Salt Lake City.

In the building of a Pacific steam road to connect the two oceans two lines were graded alongside of each other for 225 miles between Ogden and Humboldt Wells. Climbing Promontory Mountain, they were not a stone's throw apart.

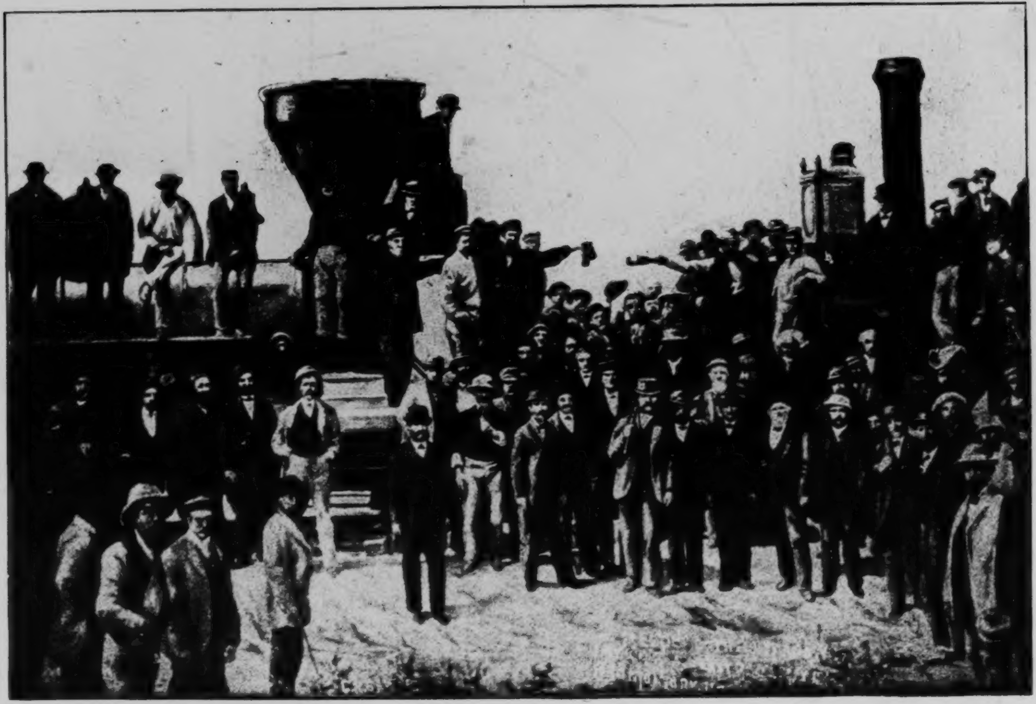
When both companies saw that neither could reach its goal they came together and we made an agreement to join the tracks on the summit of Promontory Mountain, the Union Pacific selling to the

Central Pacific 56 miles of its road back within 5 miles of Ogden and leasing trackage over that 5 miles to enable the Central Pacific to reach Ogden. These 5 miles were not only a part of the Union Pacific, but used by their line north to Idaho. This agreement was ratified by Congress. Each road built to the summit of Promontory, leaving a gap of about 100 feet of rail to be laid when the last spike was driven. The chief engineers of the Union and Central Pacific had charge of the ceremony and the work, and we set a day far enough ahead so that trains coming from New York to San Francisco would have ample time to reach Promontory in time to take part in the ceremonies.

On the morning of May 10, 1869, Hon. Leland Stanford, governor of California and president of the Central Pacific, accompanied by Messrs. Huntington, Hopkins, Crocker, and trainloads of California's distinguished citizens, arrived from the west. During the forenoon Vice-President T. C. Durant and Directors John R. Duff and Sidney Dillon and Consulting Engineer Silas A. Seymour, of the Union Pacific, with other prominent men, including a delegation of Mormons from Salt Lake City, came in on a train from the east. The National Government was represented by a detachment of "regulars" from Fort Douglass, Utah, accompanied by a band, and 600 others, including Chinese, Mexicans, Indians, half-breeds, negroes, and laborers, suggesting an air of cosmopolitanism, all gathered around the open space where the tracks were to be joined. The Chinese laid the rails from the west end and the Irish laborers laid them from the east end, until they met and joined.

Telegraphic wires were so connected that each blow of the descending sledge could be reported instantly to all parts of the United States. Corresponding blows were struck on the bell of the city hall in San Francisco, and with the last blow of the sledge a cannon was fired at Fort Point. General Safford presented a spike of gold, silver, and iron as the offering of the Territory of Arizona. Governor Tuttle, of Nevada, presented a spike of silver from his State. The connecting tie was of California laurel, and California presented the last spike of gold in behalf of that State. A silver sledge had also been presented for the occasion. A prayer was offered. Governor Stanford, of California, made a few appropriate remarks on behalf of the Central Pacific and the chief engineer responded for the Union Pacific. Then the telegraphic inquiry from the Omaha office, from which the circuit was to be started, was answered:

> To everybody: Keep quiet. When the last spike is driven at Promontory Point we will say "Done." Don't break the circuit, but watch for the signals of the blows of the hammer. The spike will soon be driven. The signal will be three dots for the commencement of the blows.



THE LOCOMOTIVES TOUCHED NOSES.

"The engineers of the two locomotives each broke a bottle of champagne on the other's engine."

The magnet tapped one—two—three—then paused—"Done." The spike was given its first blow by President Stanford and Vice-President Durant followed. Neither hit the spike the first time, but hit the rail, and were greeted by the lusty cheers of the onlookers, accompanied by the screams of the locomotives and the music of the military band. Many other spikes were driven on the last rail by some of the distinguished persons present, but it was seldom that they first hit the spike. The original spike, after being tapped by the officials of the companies, was driven home by the chief engineers of the two roads. Then the two trains were run together, the two locomotives touching at the point of junction, and the engineers of the two locomotives each broke a bottle of champagne on the other's engine. Then it was declared that the connection was made, and the Atlantic and Pacific were joined together, never to be parted.

The wires in every direction were hot with congratulatory telegrams. President Grant and Vice-President Colfax were the recipients of especially felicitous messages. On the evening of May 8, in San Francisco, from the stages of the theaters and other public places, notice was given that the two roads had met and were to be wedded on the morrow. The celebration there began at once and practically lasted through the 10th. The booming of cannons and the ringing of bells were united with other species of noise making of which jubilant humanity finds expression for its feelings on such an occasion. The buildings in the city were gay with flags and bunting. Business was suspended and the longest procession that San Francisco had ever seen attested the enthusiasm of the people. At night the city was brilliant with illuminations. Free railway trains filled Sacramento with an unwonted crowd, and the din of cannon, steam whistles, and bells followed the final message.

At the eastern terminus in Omaha the firing of a hundred guns on Capitol Hill, more bells and steam whistles, and a grand procession of fire companies, civic societies, citizens, and visiting delegations echoed the sentiments of the Californians. In Chicago a procession of 4 miles in length, a lavish display of decoration in the city and on the vessels in the river, and an address by Vice-President Colfax in the evening were the evidences of the city's feeling. In New York, by order of the mayor, a salute of a hundred guns announced the culmination of the great undertaking. In Trinity Church the Te Deum was chanted, prayers were offered, and when the services were over the chimes rang out "Old Hundred," the "Ascension Carol," and national airs. The ringing of bells on Independence Hall and the fire stations in Philadelphia produced an unusual concourse of citizens to celebrate the national event. In the other large cities of the country the expressions of public gratification were hardly less hearty and demonstrative. Bret Harte was inspired to write the celebrated poem of "What the Engines Said." The first verse is:

> What was it the engines said,
> Pilots touching, head to head,
> Facing on the single track,
> Half a world behind each back?
> This is what the engines said,
> Unreported and unread.

Not forgetting my old commander, Gen. W. T. Sherman, who had been such an aid in protecting us in the building of the road, in answer to our telegram, sent this dispatch:

> WASHINGTON, *May 11, 1869.*
>
> Gen. G. M. DODGE: In common with millions, I sat yesterday and heard the mystic taps of the telegraphic battery announce the nailing of the last spike in the great Pacific road. Indeed, am I its friend? Yes. Yet, am I to be a part of it, for as early as 1854 I was vice-president of the effort begun in San Francisco under the contract of Robinson, Seymour & Co. As soon as General Thomas makes certain preliminary inspections in his new command on the Pacific I will go out, and, I need not say, will have different facilities from that of 1846, when the only way to California was by sailing around Cape Horn, taking our ships one hundred and ninety-six days. All honor to you, to Durant, to Jack, and Dan Casement, to Reed, and the thousands of brave fellows who have wrought out this glorious problem, spite of changes, storms, and even doubts of the incredulous, and all the obstacles you have happily surmounted.
>
> W. T. SHERMAN, *General.*

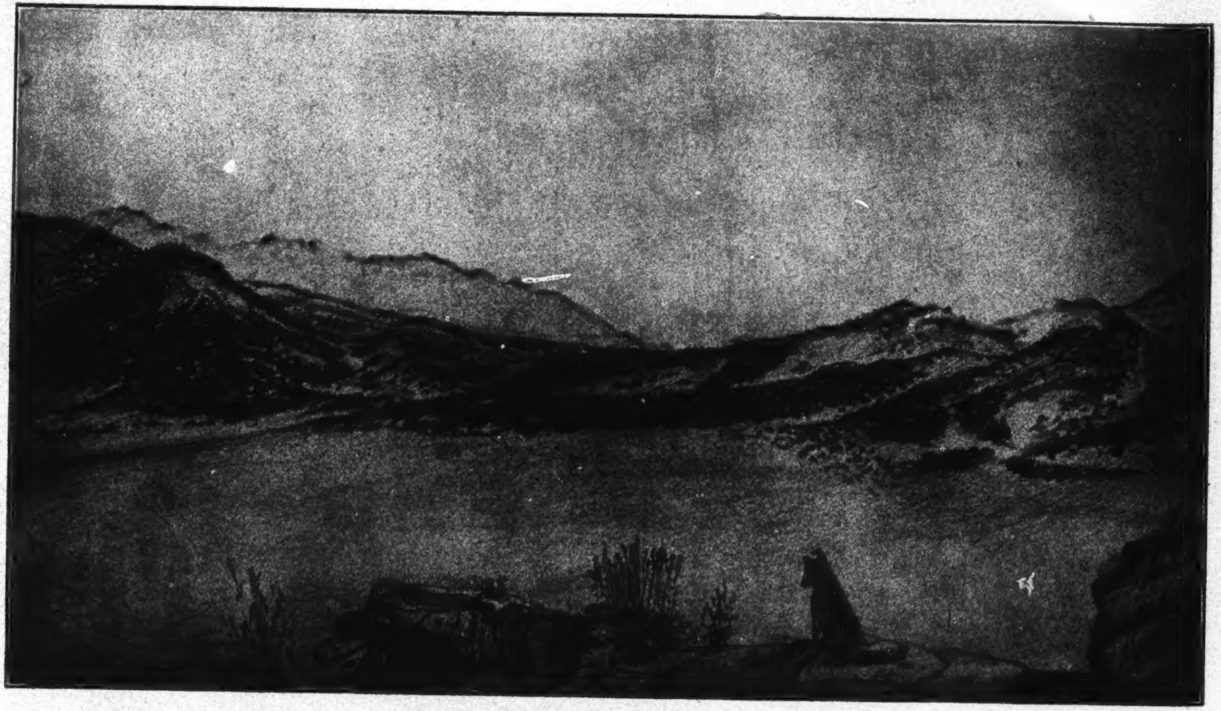
After the ceremony a sumptuous lunch was served in President Stanford's cars and appropriate speeches were made by Governor Stanford and others, and a general jollification was enjoyed. At night each train took its way to its own home, leaving at the junction point only the engineers and the workmen to complete the work ready for the through trains that followed in a day or two after.

The one thought that was in all minds was, "What of the future? What could a railroad earn that ran almost its entire length from Nebraska to the California state line through a country uninhabited, and at that date with no developed local business upon its whole line?"

My own views upon that question I expressed in my report upon the completion of the road, in 1869, in which I said:

> Its future is fraught with great good. It will develop a waste, will bind together the two extremes of the nation as one, will stimulate intercourse and trade, and bring harmony, prosperity, and wealth to the two coasts. A proper policy, systematically and persistently followed, will bring to the road the trade of the two oceans and will give it all the business it can accommodate; while the local trade will increase gradually until the mining, grazing, and agricultural regions through which it passes will build up and create a business that will be a lasting and permanent support to the company.

As soon as the road was in operation, with regular trains, the company called upon me to make an estimate of the earnings of the



CEDAR PASS, UTAH.

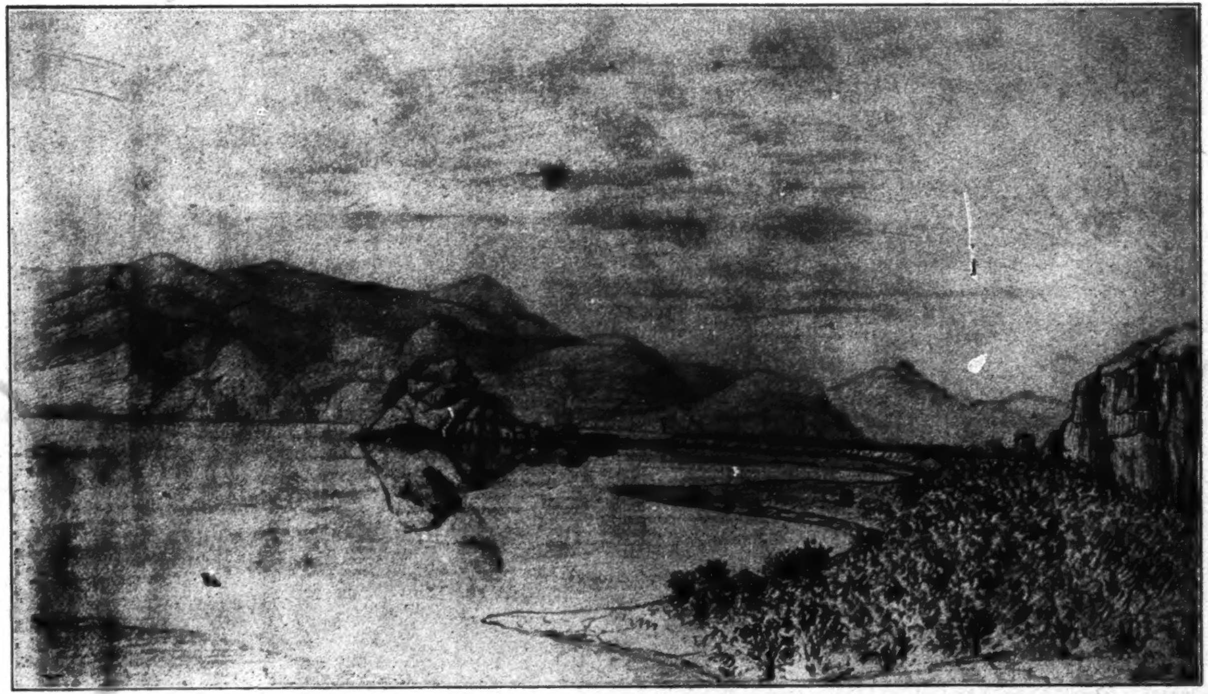
West of Salt Lake, line of Union Pacific Railway survey, 1868.

company for the next ten years. They desired that they should show a sum, if possible, equal to the interest upon all the company bonds and provide for the government sinking fund.

This was a problem that would have challenged the imagination of the greatest optimist of the time, for we had a road 1,086 miles in length, with few settlements upon it, and the country surrounding it, from our own observations, did not promise any great amount of railroad traffic. However, by claiming all the known traffic between the Atlantic and the Pacific and all the trade of foreign countries seeking Japan, China, and Australia by this route, we built up a yearly earning of $5,000 per mile, but the growth of the country even then distanced my imagination 100 per cent, and our yearly earnings in ten years rose to $10,000 or $12,000 per mile. When I look back upon the growth of the country west of the Missouri, now supporting five transcontinental lines, with all the miles of lateral roads filling the intermediate territory, with the traffic on the Union Pacific to-day demanding a double track over its entire length, I have not the ability to even guess what the future has in store. When you try to calculate the business that will be created by the Government's conservation of the country's resources, its millions spent impounding the great streams that flow east and west from the Rocky Mountains, the minerals hidden in every range and foothill, the agricultural growth from dry farming and irrigation, and the great yearly increase in population, and that to-day the country is comparatively only scratched; as it develops and grows to-day, in ten years it will require 50,000 additional miles of railroad to transport its people and its production.

When the Union Pacific was first built, over 90 per cent of its traffic was through business. Now that figure is reversed and 90 per cent of it or more is local, and this is the case of all the transcontinental and intermediate lines. There is an empire building up west of the Missouri River and on the Pacific coast from Mexico to Bering Strait. Already there is a development that has outstripped every effort to meet its demands or anticipate its necessities. To me who traveled over most of this country in the fifties and sixties, when its inhabitants were mostly Indians and its products game and grass, its growth I can not even comprehend, and its future no man can safely prophesy.

It is a great satisfaction to have lived and witnessed the development of our nation from the Lakes to the Pacific. As a result of the civil war it has made a century's growth in fifty years.



MONUMENT POINT, GREAT SALT LAKE.

The original line of the Union Pacific Railway survey crossing the lake touched this point.

WHAT I HAVE KNOWN OF HARRIMAN.

While I have known Mr. Harriman many years, I have had no railroad or business connection with him. I severed my connection with the Union Pacific Railroad when it went into the hands of the receivers. I was a member of the first reorganization committee, known as the Brice committee, but it failed to accomplish anything from its inability to come to any understanding with the Government as to the payment of the government debt.

The second reorganization committee, known as the Kuhn-Loeb committee, in 1897 succeeded in reorganizing the Union Pacific, and Mr. Harriman took an active part in the road from that time forward. First as a director, and after rising to the presidency, he controlled not only that property but from 1901 the Southern Pacific.

His great power in argument and ability to show results and his management of these roads brought him to the prominent notice of the whole country, and the support of its great banking and financial interests. The development of business along the Union Pacific made them believe the road could pay the government debt, principal and interest, and they had the nerve to make that agreement with the Government.

I remember when they were considering with the Government the payment of the subsidy debt that President McKinley sent for me to come to Washington, and while discussing the question with him I asked him if he didn't think a monument ought to be raised by the Government to the men who built that road and paid the government debt, an unheard-of occurrence at that time. He answered, "Yes," but said, "Don't you think, General, a monument should also be raised to the President who made them do it?"

In the first plans of the reorganization of the Union Pacific the main trunk line only was included, but it was soon discovered that the branches, especially the Oregon Short Line, were as important to the success of the company as the main line, and afterwards, under the management of Mr. Harriman, those branches, except the Colorado and Southern Railway, were made a part of the system. He saw later on that it was a mistake even to leave out this branch.

During the panic of 1893 the earnings of the road fell from $45,000,000 to $29,000,000, the net earnings from $16,000,000 to $4,000,000, but at the time of the reorganization the development of the country was such, and the growth of the business along the road was so great, that the value of the property grew all the time upon Mr. Harriman and his associates. The one obstacle in the way of completing the plan they had in view was that the line from Ogden to San Francisco, known as the Central Pacific, was owned and operated by the Southern Pacific, then controlled by Mr. Collis P. Huntington, who absolutely refused to sell it.

Upon Mr. Huntington's death, Mr. Harriman and his associates in 1901 formed the plan of buying the Central Pacific from Ogden to San Francisco as its original charter provided, and his success in purchasing this property is one of the keys to the great success of the Union Pacfic road. To accomplish this, he had to spend a hundred or more millions of dollars, and buy not only the Central Pacific but a road reaching from San Francisco to New Orleans, and from there by steamboat to New York. This was not only a bold but a very successful financial operation.

One person, in speaking of his great success at the time of the purchase of this property and the combining of it with the Union Pacific and other property that had been obtained, says:

> Mr. Harriman may journey by steamship from New York to New Orleans, thence by rail to San Francisco, across the Pacific Ocean to China, and, returning by another route to the United States, may go to Ogden by any one of the three rail lines, and thence to Kansas City or Omaha without leaving the deck or platform of a carrier which he controls, and without duplicating any part of his journey.

This purchase of his was a very farsighted and, in my opinion, a master stroke, although at this time the Government is trying to divorce the two roads. This is a mistake. I can not see myself how a railroad running from San Francisco to New Orleans is in any way competitive with a railroad running from San Francisco and Portland to Council Bluffs.

Mr. Harriman's heart was wholly in his work. His efforts have been only to build up, not to tear down, and there are instances within this year where he has gone to the aid of great competitive properties on the principle that it was not good policy to allow any great enterprise to fail. Though it may have been competitive with his interests, he did not fail to aid it with his advice, money, and credit, which, I think, shows that he held a very broad view, far different from the attitude most people take toward such questions.

After Mr. Harriman had obtained the Union Pacific, Southern Pacific and all its laterals and branches, he began to make a study of them. He went through them from beginning to end and as the business of the roads grew, he saw what the future for them was, and he told me that he spent almost as much money as the original cost of the road in bringing the grades of the Union Pacific, from Ogden to

Cheyenne, down to 47 feet maximum (except two places), and from Cheyenne to Omaha down to 16 feet, and in shortening the distance some 30 miles.

It is said that in developing this and the Southern Pacific roads and their lateral lines he has spent over $200,000,000, and it is for these reasons that I have said that his death is the greatest loss to the western country.

It is a very fortunate thing that he has built up and organized these properties so completely and efficiently that it will not be difficult to find some one in them to take his place and carry out his plans which contemplate as much expenditure in the future as has been made in the past.

I was much impressed as I lately came over the Union Pacific by what these improvements have meant to the road. I had been staying for two months in the mountains where other railroads cross them, and I noticed that two locomotives could haul from 15 to 20 cars only up their steep grades, while on the mountain division of the Union Pacific a single locomotive could haul from 35 to 45 cars, and from Cheyenne east they hauled 50 to 75 loaded cars. This shows where the great net earnings of the Union Pacific come from.

Every piece of property that Harriman has taken an active interest in has immediately felt his influence and got the benefit of his judgment in its operations and in the increase of its earnings. He had a great faculty for details in these matters and seemed to know intuitively how to utilize, to the best advantage, the forces working under him.

His men were loyal to him because he was loyal to them. He took a great interest in them, gave them full authority, and what is necessary for success in railroad management, stood right behind them and was not afraid, at any time, to take the responsibility of any of their acts. This, of course, was one of the great elements of his success. You never see a person along his line of roads who does not speak well of him, from the top down.

I have seen it stated lately that Mr. Harriman found, on taking charge of the Union Pacific, "two dirt ballasted streaks of rust. The stations along the mountain grades were tumble-down shacks, most of the equipment fit only for the scrap pile. From top to bottom, the Union Pacific suffered from bankruptcy, brought on by political and financial intrigue." There is no truth in this statement. When the Union Pacific went into the receivers' hands, it was carried there by a floating debt of $18,000,000, contracted in developing the property and building branches. The road was then earning some $45,000,000 gross, and $16,000,000 net, yearly, and was 10,000 or more miles in length. The demonetization of silver destroyed, for a time, the mining and other industries along the Union Pacific from the Missouri River to California, reducing its earnings to $29,000,000 gross per year. It could not stand this great decrease and carry its debt.

During the time it was in the receivers' hands its operating organization was good and the physical condition of the road was equal to or better than that of any road west of the Missouri River; while no additional mileage was added to it, its earnings were devoted to maintaining the property. As soon as Mr. Harriman took charge of the road it, like all other railroads in the United States, had to be fitted to carry the weight of the modern locomotives, cars, and trains put upon it to handle the great increase of traffic from 1897 to the present time.

Mr. Harriman saw and grasped this situation, and not only provided for this great traffic but reduced the grades of the road, shortened the distance, and made possible by double tracking it the handling of its increasing traffic for many years to come.

The great interests that Mr. Harriman controlled and those he was interested in covers the entire continent, and included not only the transportation but many industries, banks, financial interests, etc., and were far too much of a burden to place upon one man. But no matter how much we may try to avoid the accumulation of such duties, it was hard for him and will be for anyone who takes his place to stop the accumulations and combinations, for all the laws now, state and national, force consolidation and combinations. While this country grows in every direction, the controlling interests decrease in number, and legislation and financial interest cause this great change.

Under a fair wind they all seem to prosper. They stood fairly well through the panic, but the question is, How will they weather any long and steady decrease in our crops and any general decline of our greatly diversified business?

Although undersized in stature and frail in physical strength, Mr. Harriman was the boldest fighter of these times, and his success lay mainly in the fact that he was considered a fair fighter.

He had two sides to his character. One the public saw; the other, those who worked with him and were close to him saw. He had a kind word for everyone who was trying to succeed. He was especially kind to those who were in his immediate employ, and he had a heart that went out to all appeals from those in trouble. He was devoted to his family and his home.

We who knew him can appreciate the West's great loss; but if he had to go, it was best that he should fall at the zenith of his great successes and at a time when his great work was moving steadily forward, well manned and well in hand.

EAGLE NEST, UTAH.

(Note the nest on the summit of the rock.)

TRIBUTE TO GEN. G. M. DODGE ON HIS WORK IN BUILDING THE UNION PACIFIC RAILWAY.

By John N. Baldwin, General Solicitor of the Union Pacific Railway, at the Meeting of the Society of the Army of the Tennessee at Council Bluffs, Iowa, 1906.

Mr. TOASTMASTER, LADIES, AND GENTLEMEN:

Though solemnized by the ceaseless mutations of time, this is an occasion well calculated to awaken the buoyancy and quicken the heart beat of every citizen who loves his country and its institutions.

In this time of great national eminence, with happiness regnant in 20,000,000 American homes, with our astral emblem honored and respected throughout the world, with the seat of peace of both hemispheres by the Potomac, with a nation distinguished for its commerce, its wealth, its Christianity, and its enlightenment, it is meet that we should pause in our onward flight to acknowledge with full hearts our love, our reverence, our boundless gratitude, and obligation to and for our preserver and benefactor—the Union soldier.

We have with us to-night one of the chief actors in what history truly represents as the greatest tragedy ever played in the theater of war. He saw the curtain rise on Fort Sumter and fall on Appomattox. He shared with his comrades in arms the fortunes and misfortunes of military life, and like them he received his plaudits and his wounds.

I have the honor to speak of our distinguished fellow-townsman, our neighbor, our friend, Gen. Grenville M. Dodge.

If our honored friend experiences some embarrassment as he listens to the recital of his deeds and achievements, he must remember the pleasure it affords those who offer their tribute and their expressions of esteem, and also remember that if the struggles and triumphs of the strong and successful are never to be recounted, the inspiration of worthy action might be lost and many tender chords remain untouched.

> Let us, then, be what we are and speak what we think, and in all things keep ourselves loyal to the truth and the sacred professions of friendship.

I believe that it will be both profitable and pleasurable for us to stop a moment during these tempestuous, tumultuous, businessexpanding, wealth-getting, and property-developing times and seriously contemplate the rugged and lasting qualities of such a man as General Dodge, and also with fitting ceremony and circumstance in the presence of the highest in the community, give to him his true meed and merit.

The Army of the Tennessee is conspicuous in American history. Around it is woven the story of the civil war. It participated in more than forty engagements, among them being a number of the greatest battles of that war. It not only participated, it was in the thick of the conflict, and was often the medium through which defeat was turned into victory. More than once the fate of the Union depended upon its prowess and soldierly valor. It was so at Shiloh, Vicksburg, Corinth, Atlanta, and in fact nearly all the great battlefields of the war. As General Grant, speaking of Vicksburg, says in his personal memoirs, "It looks now as if Providence directed the course of the campaign, while the Army of the Tennessee executed the decree."

The name of General Dodge will forever be associated with the Army of the Tennessee, its great soldier in time of war and its great citizen in time of peace. He was one of its best and honored commanders, a fit companion of Sherman, McPherson, and Logan. In the personal memoirs of Grant, Sherman, and Sheridan are found the highest testimonials of these great soldiers to the valor, courage, skill, and bravery of General Dodge. Commendation from such a source is a priceless legacy.

I desire to speak to-night of the achievements and triumphs of General Dodge in the ranks of private citizenship. While he has illuminated the pages of American history with his deeds of valor, he has also made his impress as a private citizen in the sphere of industry.

It is not the rule that men ascend to eminence by leaps and bounds. It is by steady tread that we move up the rough and rugged path to success. This is an age of concrete thought, and those of whatever vocation who rise above mediocrity and reach eminence and distinction are they who subject their lives to the crucible of hard intellectual and physical endeavor.

We often and wisely repeat the truism that man is the architect of his own fortune. Individuality is the despot, destiny the subject.

I do not subscribe to the doctrine that all men are created equal or that at the threshold of life's contest all are equally armed, but among those who are thus favored some fail while others succeed, thus establishing the fact that success is a reward, not a legacy.

A man rising to eminence acquires that estate at tremendous cost. Many they are who crave it but few they are who are willing to strive for it in the only way it can be obtained; that is, by hard and constant

LARAMIE PEAK, WYOMING.

On line of Union Pacific Railway survey, 1867.

endeavor. And it is not true that those who stand on the pedestal of fame are, as a rule, those who have crossed life's chasms on the bridge of sacrifice.

General Dodge's position to-day in the business and transportation world represents an investment of years of hard labor and useful life. Without heraldry of birth, without moneyed or influential friends, but with labor, diligence, integrity, and faith in himself, he has risen steadily and marked a path across the railroad world. Studious, thoughtful, and indefatigable. He has had much to encounter and much to conquer. He never despised an opponent and never became careless, and he never feared one and therefore never became unnerved. He always had faith. He may have thought sometimes in the struggle that right would be defeated, but he never believed for a moment that wrong would triumph. Fidelity was his sovereign, loyalty his guide, and devotion his ruler. He bivouacked at his post of duty and absolutely only sought relief and solace in increased opportunity.

He is the very incarnation of resoluteness and determination. It is because he saw events and their causes, strove to obviate consequences, studied to ascertain contingencies, and because of caution and foresight, that he became distinguished in this realm of action, reaching a point where he had no superiors.

The Pacific railways were the great constructive forces in the development of the country west of the Missouri River, and of these the Union Pacific was the pioneer and the first to lead the march of civilization into the wilderness. It was not conceived for private ends nor born of the spirit of commercialism, but was created to preserve a republic and projected by the impulse of improvement. It is the only railroad in the United States that was constructed under federal muskets and protected by federal troops, and of which it was said by the Supreme Court of the United States that the people of this country would have sanctioned the action of Congress in its creation if it had departed from the traditional policy of the country regarding work of internal improvement and charged the Government itself with the direction and execution of the enterprise.

Its construction began on the 2d day of December, 1863, on the west bank of the Missouri River, in the city of Omaha. May 10, 1869, on Promontory Point, Utah, with simple but impressive ceremonies the last spike was driven, fastening the connecting rail between the Central and Union Pacific railways, completing an iron highway between the two oceans and consummating one of the greatest achievements of the age.

President Lincoln, fully appreciating the genius and indomitable will of General Dodge, immediately after the war called him to the task of construction of the Union Pacific Railroad. He turned his face, recently bathed in the smoke of musketry, toward the " Wilderness," the " Rockies," and the " Great American Desert," and he surveyed and supervised the construction of that road, then a " military necessity," now one of the great systems of railways which move the commerce of the world. He had no maps or charts to afford him information of the topography of the country. The territory traversed was designated in text-books as a wilderness designed by nature to be the eternal habitation of the savage and the buffalo.

Limited by law to a maximum gradient of 116 feet to the mile, not compensated for curvature, he held it down to 90 feet to the mile. Pressed for time, Congress impatient, the people demanding an early completion, he had to contend with hostile Indians, inadequate funds, lack of transportation facilities, high-priced labor, and numerous other obstacles, but in spite of all he pushed his line across the continent, consummating a feat in railway engineering unequaled in the history of American railway construction.

To emphasize this great achievement, I speak authoritatively, officially, and with full knowledge of the facts when I say that the present management of the Union Pacific, for the express purpose of shortening the line between Council Bluffs and Ogden, and bettering it, if that were possible, had surveys and revisions made and expended millions of dollars in eliminating gradients, curvatures, and tunneling mountains, with no limit as to time or means, with full knowledge of the topography of the country, with all modern appliances, with the services of a corps of the ablest engineers, yet it only succeeded in reducing the distance less than 40 miles. And this reduction in mileage was due largely—in fact, almost entirely—to changes in gradients and curvatures, which were rendered impossible to General Dodge by reason of lack of funds.

To General Dodge these were years tense with their stress and strain, heavy with unremitting toil, thrilling in danger, but he still pushed ever forward and onward with the confidence of a conqueror. He was a man of judgment and common sense, who spared nothing and wanted everything; a man who believed in action and knew the value of every moment of time. And above all, my friends, actuated by the impulse to better his country, himself, and his descendents, he toiled with those who overcame this wilderness and converted this great "American Desert " into a " Garden of Benefits."

And to you, remaining members of the Army of the Tennessee, now in the twilight of life, I offer the sentiment which pervaded the soul of the Cumaean Sibyl when she presented her books to Tarquinius Priscus, "As you grow fewer in numbers you become dearer to our hearts."

LARAMIE RIVER CANYON, WYOMING.

On line of Union Pacific Railway survey, 1867.

SPEECH OF G. M. DODGE IN CONGRESS, MARCH 25, 1868, ON THE UNION PACIFIC RAILROAD.

Mr. SPEAKER: As there appears to be some misapprehension as to the true status of the Union Pacific Railroad and its branches, all I desire to do is to set forth the facts in relation to that enterprise. I have no defense of the company to make. I leave that to the country and this House; but, sir, I believe I know as well as any man can what that company has done and what its intentions are. I will notice briefly a few points of the gentleman from Wisconsin. I believe that he does not desire to misrepresent that great enterprise, and I therefore desire to correct a few statements that bear directly upon the subject before the House. The gentleman says the Government has given absolute control to parties managing the Union Pacific Railroad. Does he not know that the Union Pacific Railroad has to build its road under the supervision of three government commissioners, who examine and criticise every mile of road built before it is accepted by the Government, and that they, under oath, certify the road is a first-class American road before $1 or 1 cent can be obtained from the Government? And this is not all; every act of the board of directors and of the company is criticised and scrutinized by 5 government directors, appointed by the President, and forming one-fourth of the board of directors. One of these government directors has a position on each one of the committees, and nothing can be done in or out of the board but what they have full cognizance of. No other of the roads receiving government aid has any such board or any such supervision, and these directors have full knowledge of the rates of freight, the necessity for these rates, etc.

The gentleman says it is a work that over sixty millions of the people's money is to be invested in, whereas the law prohibits the loan of over fifty millions of credit or bonds to the main line, and so far not a cent of the people's money has been put into the enterprise, the company having fully paid their interest on bonds; and if the money saved to the Government in the transportation of government freight, mails, troops, etc., should be made a sinking fund it would pay off the entire debt or entire amount of bonds within thirty years. In another place he says:

> If we see fit to sacrifice posterity to this giant monopoly, that they will have $100,000,000 of the people's money in their hands; that they (the company) will defy any legislation.

Now, sir, I do not understand where the gentleman gets his $100,000,000, as I have shown the company can only obtain $50,000,000 on the main road under any circumstances. The amount really granted to the company is as follows:

For 534 miles, at $16,000 per mile	$8,544,000
For 300 miles, at $48,000 per mile, namely, 150 miles of mountain work from Cheyenne west, and 150 miles of mountain work from near Sacramento east, which equals	14,400,000
For 898 miles crossing the main divide of the continent, the Wasatch, Promontory, Laone, Taone, and Humboldt ranges of mountains, at $32,000 per mile, amounting to	28,736,000
Making a total amount of bonds for the main through line of	51,680,000

If the company received pay on the full length of line that they will have to build to complete the road from the Missouri River to Sacramento; but as, under the law, they obtain only $50,000,000 for 1,832 miles of road, counting the distance to San Francisco, they get an average of a little over $27,000 per mile; that the Government loans its credit for the purpose of obtaining an all-rail communication from the Atlantic to the Pacific through a country, over mountains and plains, that no private enterprise would for one moment invest 1 cent without government aid. If this road is to be the great thoroughfare that the gentleman says it will be, then the government freight that will alone go over it will more than pay their interest on the loan.

And now, sir, the gentleman says the Government has furnished every dollar to complete this road—in other words, that not 1 cent of money has been put into the enterprise outside of the Government—and I deny in toto the statement of the gentleman. I say up to the present time that that company has furnished and spent more money in building the road than the Government has loaned; and, according to the gentleman's statement, they have only built as yet the easiest portion of the road; he says 500 miles of the built portion is a dead level, and assumes the contract to commence at Omaha. This is not the fact; it commences 247 miles west of Omaha. Therefore all his assertions and assumptions fall to the ground, being based upon false premises. When you compare the rates of this road with other roads you will not see so vast a difference as is endeavored to be shown.

The Union Pacific Railroad charge about 7 mills per 100 pounds of freight per mile. The great Eastern routes, competing for freight between the great cities of the East and the great West, charge from 2½ to 4 mills per 100 pounds per mile, they having all the advantages of civilization, concentration, transportation, the cheapness of material, fuel, repairs, etc.; while the Western roads—the roads east of the Missouri River—charge 4 and 5 mills on 100 pounds per mile. Many of the local Southern railroads charge 4, 5, 6, and as high as 7 mills per 100 pounds of freight per mile. As to passenger fare, the Union Pacific Railroad Company is now charging 10 cents per mile; the Northwestern Railroad Company, 4 cents per mile; the Chicago, Rock Island and Pacific Railroad Company, 3½ cents per mile; the Richmond, Danville and Piedmont Railroad Company, 6 cents per mile; and these roads are all in a heavily settled country, with heavy local business, while the Union Pacific Railroad runs 500 miles into a wilderness, without comparatively any local business, nearly all their freight and travel going but one way.

Now, sir, the past year coal for fuel has cost the Union Pacific Railroad Company from $28 to $42 per ton, delivered at places for use. It has had to be obtained in Illinois, Missouri, and Iowa, and has had to be transported from 500 to 1,000 miles before the company could use it. Again, wood, at first cost, has been $6 to $11 per cord, and when laid down at the points for use averaged about $18 to $20 per cord. Labor and living of all kinds on the Union Pacific Railroad and br[illegible]es are one-third more than on Eastern roads. Material for repa[illegible]s of road, cars, running stock, building material, and all other things pertaining to the keeping up and furnishing the road, have to be transported from the East. And the gentleman asks this House to burden us with rates and fares that he knows the road could not earn its running expenses under.

As soon as the road reaches the coal fields 100 miles west of the track, then the companies propose to reduce the rates and fare themselves; they have already reduced them somewhat; and so far as these railroad companies being a grinding monopoly it is far from the facts in the case, and is not substantiated by any proofs whatever. The gentleman, it seems to me, takes a very singular way to protect the Government. He charges that the bonds will never be paid; that our rates are equal to old rates by wagons and stage, and he comes in here with a proposition that, if adopted, would prevent these companies from earning sufficient money to even pay the interest on their bonds. It is the first time that I ever saw the mortgagee come in and endeavor to injure the value of the property of the mortgagor, and if possible put the property on which he holds a mortgage in a condition that they can not only pay the mortgage, but not even the interest on the mortgage.

Now, Mr. Speaker, as to the rates as compared with former rates as paid by the Government for transportation of its freight. The average price paid by the Government for 1865, 1866, and 1867, inclusive, on route No. 2, from Leavenworth west, was $1.57 per 100 pounds per 100 miles, or 1½ cents per mile per 100 pounds—more than double the rates upon the Union Pacific Railroad and branches; and in the last year the Government has saved by transporting its freight on the Union Pacific Railroad, eastern division, over what it would have had to pay if transported by wagon trains over an average transportation of only 104 miles of railroad, $335,138; or, if that road had been built 300 miles west, it would have saved by this "great monopoly," with its "exorbitant rates and tariffs," over $1,000,000. And the statement made by the Quartermaster-General of the rates of freight over the plains, over route No. 1, the Great Platte Valley route, for the last six years, is as follows:

QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., March 24, 1868.

Hon. G. M. DODGE, M. C.,
Washington, D. C.

SIR: In reply to your communication of the 20th instant to this office requesting information as to the rates paid for each year for the last five years and the total number of pounds of stores transported and total cost for such transportation on route No. 1 for 1866 and 1867, I have the honor to state that the rates of transportation per 100 pounds per 100 miles on route No. 1 for the last five years, including the contract rates for the present year, are as follows:

1864:		1867–68—Continued.	
April	$2.25	June	$1.64
May	2.25	July	1.64
June	2.25	August	1.64
July	2.25	September	1.99
August	2.25	October	1.99
September	2.25	November	1.99
1865:		December	1.99
April	2.26	January	2.50
May	2.26	February	2.50
June	2.26	March	2.50
July	2.26	1868–69:	
August	2.26	April	1.90
September	2.26	May	1.75
1866:		June	1.60
April	1.45	July	1.60
May	1.45	August	1.60
June	1.45	September	1.75
July	1.45	October	1.75
August	1.45	November	1.90
September	1.45	December	2.00
1867–68:		January	2.50
April	1.64	February	2.50
May	1.64	March	3.00

This office is unable at present to furnish the number of pounds of stores transported over route No. 1 for the years 1866 and 1867, and the cost of such

transportation for that time; but the information desired on this point has been this day called for from the chief quartermaster military division of the Missouri, which, as soon as received, will be forwarded to you.

Very respectfully, your obedient servant,

D. H. Rucker,
Acting Quartermaster-General,
Brevet Major-General U. S. Army.

The average is $2 per 100 pounds per 100 miles, or 2 cents per mile, being 1 cent and 3 mills above the rates of the Union Pacific Railroad. The Quartermaster-General is now unable to give me the precise facts as to the saving in rates, but we can figure for ourselves. The government transportation over the road last year was about 20,000,000 pounds of freight, and the Union Pacific Railroad transported it, on an average, 400 miles; showing a saving to the Government on its freight alone, at the average price of the last six years, of about $1,040,000. If we take the price that the contracts are let for this year and apply it to the amount of freight that will be transported over from 500 to 800 miles of line, the saving will reach nearly $2,000,000 on the Union Pacific Railroad, and nearly $1,000,000 on the Union Pacific Railroad, eastern division.

And now, Mr. Speaker, what are the facts in relation to the Union Pacific Railroad? This road was projected some fourteen years ago. The first examination as to its feasibility was made by private enterprise and private capital, and a connection with it, dating back to its first inception, renders me able to state some of the difficulties under which it has labored. The examination made by me thereon and reported to the capitalists of the United States showed that at that day or this it would be impossible to build that road upon private capital and credit alone. The country demanding the railroad, the Republican party, in its farseeing and liberal policy, seeing the necessity of this railroad, indorsed it, made it a part of their platform, and breathed life into it by the bill passed in 1862. But even then, with that law and that grant, it was found impossible to raise the funds to push it forward or even to build a mile of the road. The Congress seeing this amended the act in 1864, and after the passage of that act this great monopoly, this great swindle, could not obtain the means for one year to start the work.

A few men took hold of the enterprise, threw their fortunes and their energies into it, and the capitalists of the country looked upon it as so foolish an act on their part that they were actually shunned as prospective bankrupts; their paper would not be taken except upon first-class collateral securities, and within one year the enterprise came near failing for want of financial support. But the energy and determination displayed by that company; the unheard-of ability displayed in pushing forward the work; the unexpected development of that country that the enterprise caused, called the attention of the world to it, and now, to-day, the men who would not one year ago have put a dollar into it are denouncing it as a great monopoly, and trying to cripple it by unjust and unequal legislation. If it is a success, and any money is made out of it, it will be simply and merely from the fact that a few men had the nerve and the foresight to throw their all into the scale, and "sink or swim" with the enterprise. And, Mr. Speaker, to reach the success they have to-day, no person can for one moment know or see the obstructions, prejudice, and obstacles those companies have had to meet and overcome. The first 500 miles of road were built without an eastern connection; they had to start hundreds of miles away from any railroad connection, in a country entirely destitute of the proper means or material for building a road; paying enormous prices for labor and material; transporting the superstructure and equipment by water at from 33 to 50 per cent more than it would cost to build the same length of road in a country affording railroad facilities. The iron laid down cost $125 a ton, equipment and everything else pertaining to the road that came from the East costing in the same proportion.

The first year the company, under these circumstances, built about 40 miles, the next 260, and the next 250 miles, but with a lavish expenditure of money that astonished the world. Who, in 1864, could have been made to believe that this company would have accomplished what it has? What class of men except those who had this enterprise at heart would have paid 33⅓ per cent more for building the road merely for the purpose of obtaining distance when, if they had carried out only the true letter of the law, they could have saved that amount and put it in their pockets? Have they had at interest themselves more than the country? I hold not, for I know that their orders have been to give them the most miles of road in the least possible time, no matter what it cost. And in their contract they have provided $7,500 per mile for the equipment of the road, a sum far beyond any ever before provided for a new road under similar circumstances; and when built and equipped this sum will give it the best machinery, the best shops, and the most liberal supply of rolling stock of any road in the country for the business it has to transact. During the past two years the road has been built through an Indian country with all the tribes banded together and hostile. Our best and ablest men have been killed; our cars and stations and ranches burned; our men driven off and our stock stolen. Graders and track-layers, tiemen, and station builders, have had to sleep under guard, and have gone to their work in the daytime with their picks and shovels and their mechanical tools in one hand and the rifle in the other, and they often had to drop one and use the other.

It may not be known, but it is a fact, that the graders went to their work as soldiers, stacked their arms by the cuts and worked all day, with hostile bands of Indians in view, ready to pounce upon, kill, and scalp any unlucky or negligent person who gave them an opportunity. The company paid not only the cost of the work proper, but contractors were often paid large sums for the risks they run. It is an easy matter to-day, after the enterprise has been made a success, and when we can just begin to see the beginning of the end, when daylight begins to open on the future out of these years of darkness, for men to now come in and endeavor, for some reason, I know not what, to hamper these roads, to pass laws that they know will make them spend the energies that it is their duty to put on the road and which are necessary to complete it, in trying to break down the barriers that this bill, if passed, will make against those roads in the financial market. And I doubt if the gentleman from Illinois or the gentleman from Wisconsin, who appear to make this great republican national work their special objective point, would, for all the money in it, stand as I have had to do, at the risk of my life, and endeavor to keep men from abandoning the work; would travel as I have done to make the surveys and construct the road, obliged to keep all the time within the range of a government musket, for to be outside of it was to lose your scalp.

And now, Mr. Speaker, while the Government has been liberal to this great enterprise, I hold and can prove that while the road has received this liberal credit, that it will bring to the Treasury millions in the saving of the extra expenses in freight; that it must and will develop a country whose wealth no one to-day can predict. The mountains those roads cross are no myth, as the gentleman states, but were formidable obstructions in its path, which have been overcome by the skill and energy of the company. These mountains are underlaid with gold, silver, iron, copper, and coal. The timber ranges that those roads pass will develop an immense lumber trade, and the millions upon millions of acres of government land that they will bring into the market and render feasible for settlement will bring to the Government more money than all the bonds amount to; and this land and these minerals never would have brought this Government one cent if it were not for the building of these roads. The inaccessibility and the trouble and cost of developing the country through which they run would have cost ten times more under any other circumstances than it would have yielded. And now, Mr. Speaker, these Union Pacific railroads, when completed, will build up an interest right in the center of that heretofore great unknown country, an empire that shall add to our wealth, population, capital, and greatness, from a source we never expected, and by no other means could we ever obtain.

THOS. B. MORRIS, ASSISTANT ENGINEER, AND PARTY, SALT LAKE, UTAH.

From left to right, top row: Isaac Rogers, Jesse Corbus, W. Wykoff, Unknown, Trowbridge, R. W. Fulton, W. M. Brown.
Middle row: S. E. Ricksecker, Thomas B. Morris, H. L. Koons.
Lower row: J. Brown, James H. Martineau, James Larkins, Evenden, Sabin, Alec.

THE CIVIL ENGINEER IN AN EARLY DAY AND IN THE CIVIL WAR.

Address delivered before the Western Society of Civil Engineers.

I have been requested to talk to you about the civil engineers of my day. This is a subject of so much importance and so much breadth that it is almost impossible to grasp it. The work of the civil engineer in developing our country and in the civil war has never been comprehended or proper tribute paid to it, and I can take it up only in small details. Perhaps I can show it to you more clearly by stating what I saw of it personally, and this will be better than trying to go into the subject generally.

A young boy, 20 years old, I left Norwich University, Vermont, a military college, as a civil and military engineer. My military training was of as much or more benefit to me generally, perhaps, in the work I had to undertake, than what I had learned of engineering, for it taught me how to command men; it gave me discipline, a respect for authority, obedience to order, loyalty to my country, and an interest in the work of my employer, which would have been impossible for me to have obtained in any other way. I came West and took an axman's place in an engineering party on the Illinois Central Railroad. Mr. Blackstone was the division engineer, with headquarters at La Salle, Ill. I was assigned to a party that was running a line from La Salle to Dixon. As soon as I joined it I saw its chief was a lazy fellow. He soon learned that I could run an instrument, and put me at that work, he staying in the house pretending to work up the data we obtained in the field. It was a cold winter, the thermometer often below zero; and I thought I saw plainly the line I was running would not be acceptable and made up my mind that as soon as we returned to La Salle to leave the party and seek a position somewhere else, for I was satisfied that Mr. Blackstone would discharge the entire party. I followed this inclination. When I returned to La Salle and submitted our work I called upon Mr. Blackstone, asking him for my pay, stating I was going to leave. He greeted me very cordially and seemed astonished at my request. However, he paid me and I immediately left. Years after this incident, when I had become better acquainted with Mr. Blackstone, he used to make a good deal of fun of me by stating he knew I had run the line, that it was a good line, and that he intended to give me the chief's place and put me at the head of the party, thus showing that I was a little previous in my act, and that I did not know how good a line I had run.

When I came West I had in mind the Pacific Railroad, and as an indication to you of my enthusiasm in that quarter, I quote an extract that I wrote home from Peru, Ill., September 12, 1851. It is as follows:

> I closed my last letter by saying that there was good news. A telegraph dispatch was received here that the Rock Island road, 200 miles long, was to be built; that Sheffield & Farnam, of Connecticut, had taken the contract. This will give direct connection by the Rock Island road with Wisconsin, Iowa, and Oregon, for this is the true Pacific road and will soon be built to Council Bluffs, where a road from St. Louis will meet it. Then from Council Bluffs to San Francisco, this being the shortest and most feasible route. In an eastern direction, this road connects with the Michigan Southern, which is nearly completed to Chicago, and will give us through railroad connections with New York and Boston.

The Council Bluffs I mention was that named by Lewis and Clark, the town now known by that name not having been organized at that time.

I left the Illinois Central and went to the Rock Island as axman under Mr. Peter A. Dey, who was the division engineer stationed at Tiskilwa, Ill. I was with Mr. Dey about eight months, and under his direction had made a survey of the Peoria and Bureau Valley Railroad in Illinois. Mr. Dey was promoted to chief engineer of the Mississippi and Missouri Railroad and took me to Iowa as his principal assistant, placing me in charge of a party in the field, which was a very fine promotion for the limited experience I had, and it is one of the greatest satisfactions of my life to have had his friendship from the time I entered his service until now. Mr. Dey is not only a very distinguished citizen of Iowa, but is one of the most prominent engineers of this country. He was known for his great ability, his uprightness, and the square dealing he gave everyone. He has greatly honored his State in the many public positions he has held. He has a wide reputation as engineer and railway constructor, and in later years as railway commissioner of that State.

In May, 1853, we crossed the Mississippi River at Davenport and surveyed the first railroad line across Iowa. The settlements in Iowa then were confined almost entirely to the country between Davenport and Iowa City. From Iowa City west to Des Moines there were very few people, and from 12 miles west of Des Moines to Council Bluffs there were none. On reaching the Missouri River my party was instructed to push west into the great Platte Valley to determine where a road running up that valley would strike the Missouri River. That country then was occupied solely by Indians. There was scarcely a man in my party who had seen an Indian. We crossed the river in a flatboat, and I commenced the surveys west from where the city of Omaha now stands. After I had raised the bluffs skirting the Missouri, I left the party in charge of my assistant, Mr. J. E. House, and went on alone some 25 miles to the Elkhorn Valley, looking up the country ahead. On reaching the Elkhorn Valley about noon, I lariated my horse, took my rifle, hid it, and, making a pillow of my saddle, lay down to take a rest. I had lost a good deal of sleep and was very tired. How long I slept there I do not know, but I was awakened by the noise of my pony. Jumping up, I saw an Indian leading him toward the Elkhorn River as rapidly as he could. The pony was holding back, being evidently very much frightened at the Indian. I was greatly frightened, hardly knowing what to do, but I grabbed my rifle and rushed after the pony and the Indian, yelling at the top of my voice. The Indian let go the horse and swam across the Elkhorn out of my reach, and I was very glad to see him go. In 1865, during the Indian campaign I made upon the plains, that Indian was an enlisted man in a battalion of Pawnees. He told his commander, Major North, that the reason he gave up the horse was I made so much noise it frightened him so it nearly scared him to death.

Returning to the party I found them camped on the Papillion Creek, with the camp full of Indians and every man in the party cooking for or feeding them. I saw that radical action had to be taken or the provisions I had would all be gone. My party was thoroughly armed. I got them together immediately and notified the Indians to get out. By my prompt action they saw we meant business and left us. From that time until I stopped my work on the plains I never allowed the party to have Indians come into camp except by the party's permission.

This is the kind of responsibility the young engineer in that day had to undertake. He was away from anyone to advise with or to lean upon. He was responsible for his party, its life and safety were in his hands, and in the development of this country the risks taken and the dangers faced have never been told.

From this time until the civil war we were engaged in building the railroad to the capital of Iowa, Iowa City, and in making reconnoissance west of the Missouri River for a Pacific railroad. It might seem strange to you that although the Government spent millions of dollars in examining different routes for the Pacific railway, covering the country between parallels of 32 and 49, which reports of examinations were printed in 11 large volumes, no examination was made by the Government upon the most feasible route across the continent; that was left to private enterprise. Our exploration and reconnoissance, up to 1860, had determined on the forty-second parallel of latitude, practically the present line of the Union Pacific Railroad crossing the continent. The detailed surveys had not been made, but the buffalo, the Indian, the fur trader, the telegraph, the pony express, the stage line, and finally the engineer determined that line, and the road, when built, followed it.

In 1861 the civil war came. I went into the service with 600 other civil engineers, who were graduates of Norwich University, all of whom became commissioned officers, many of them rising to the highest rank and to the highest command. Their work as civil engineers during the war was only second to that of their military duties as a soldier, and for this work as civil engineers they have received no credit. Also, there were many enlisted men detailed as engineers; they mapped out the roads and the streams; they rebuilt the railroads and they destroyed them; they made many of our campaigns possible by their facilities in overcoming obstacles; they built temporary bridges; they showed great ingenuity in throwing up temporary entrenchments, even during the battles, and they constructed impregnable forts; always brave, never flinching a duty, and there is no commander of a brigade, division, or corps but who appreciated their great and valuable service.

In 1862 I was assigned to the command of the central division of the Mississippi, with orders to reconstruct the railroad reaching from Columbus, Ky., to Corinth, Miss., for the purpose of bringing supplies to the army then concentrated at Corinth. This line of road crossed many deep bayous which had been spanned by truss bridges, all of which had been destroyed by the enemy as they retreated, and, as I looked at the task before me and saw those deep bayous with no foundations and with no possible means of putting in proper piers and abutments or furnishing proper superstructure, it was a problem appalling to anyone. I had two Wisconsin regiments in my command; one was commanded by Col. George E. Bryant, who had been a Norwich University cadet and a civil engineer. He commanded a regiment that was raised in the logging camps of Wisconsin. As soon as I received this order I ordered every engineer, civil or mechanical, or anyone who had any experience in such work in the command to report to me, and I was astonished to see the number of enlisted men who reported. We held a consultation as to how we should handle this problem, and decided to put the Twelfth Wisconsin into the woods with their axes—that was about all the tools we had—to make crib piers for these streams.

It was easy work for us to handle the culverts, and it was astonishing how soon we rebuilt this railroad. The log cribs were bolted together by dowel pins made from the iron rods of the house truss. We made stringers 30 and 40 feet long and sunk our piers to a foundation that would carry our trains. Within two months we had rebuilt this road and had put up at each important bridge a blockhouse so a small force could hold it against almost any enemy, and in the celebrated raid of Forrest up through that country, where he destroyed most of the bridges south of Jackson, Tenn., when he struck the blockhouses in our territory he was repulsed at every point. This drew the attention of General Grant to our work, and he immediately ordered blockhouses built at every bridge on the railroads within his command.

The ingenuity of these young engineers in putting up these bridges, blockhouses, and stockades, in overcoming every difficulty, and the interest they took in their work soon convinced me that all it needed in our army for effective construction or destruction of a railroad was proper organization of the material in hand. The mechanics in the command put the locomotives and cars on their feet and run them, so that virtually the young engineers and young mechanics in that command recreated the road, and as long as my corps was under General Grant's direction or that of General Sherman whenever there was any destruction or reconstruction of any kind to be accomplished it fell to us, until the pioneer corps of the Sixteenth Army Corps had as good a reputation for their mechanical work as they had for their fighting ability.

In the fall of 1863, when General Grant was ordered to Chattanooga, my corps was lying at Corinth, when it received orders to join Sherman in his march to the relief of Chattanooga. Having a much longer distance to march than any of the other commands, I was not able to reach Chattanooga in time to take part in that battle, but when I reached Pulaski, on the Nashville and Decatur Railroad, I received orders from General Grant to halt and rebuild that line from Nashville to Decatur, the entire line having been destroyed. There were several truss bridges crossing Duck River, and also some very high trestles, some of them being 125 feet high; also the Tennessee River had to be crossed. General Grant was very anxious to have this road built rapidly, in order to feed his army at Chattanooga, which was in great distress, and Sherman told me the quicker I built the road the sooner I would get something for my command to eat, as we were entirely away from any base of supplies, living off the country, and had been doing so during the entire march.

The work of the young engineers in rebuilding this road is a good deal better stated by General Grant in his Memoirs than I can tell you, and I will read what he says:

> I gave an order to Sherman to halt Gen. G. M. Dodge's command, of about 8,000 men, at Athens, and subsequently directed the latter to arrange his troops along the railroad from Decatur north toward Nashville, and to rebuild that road. The road from Nashville to Decatur passes over a broken country, cut up with innumerable streams, many of them of considerable width, and with valleys far below the roadbed. All the bridges over these had been destroyed and the rails taken up and twisted by the enemy. All the cars and locomotives not carried off had been destroyed as effectually as they knew how to destroy them. All of the bridges and culverts had been destroyed between Nashville and Decatur, and thence to Stevenson, where the Memphis and Charleston and the Nashville and Chattanooga roads unite. The rebuilding of this road would give us two roads as far as Stevenson over which to supply the army. From Bridgeport, a short distance east, the river supplements the road.
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> General Dodge was an experienced railroad builder. He had no tools to work with except those of the pioneers—axes, picks, and spades. With these he was able to entrench his men and protect them against surprises by small parties of the enemy. As he had no base of supplies until the road could be completed back to Nashville, the first matter to consider after protecting his men was the getting in of food and forage from the surrounding country. He had his men and teams bring in all the grain they could find, or all they needed, and all the cattle for beef, and such other food as could be found. Millers were detailed from the ranks to run the mills along the line of the army. When those were not near enough to the troops for protection they were taken down and moved up in like manner. Blacksmiths were detailed and set to work making tools necessary in railroad and bridge building. Axmen were put to work getting out timber for bridges and cutting fuel for locomotives when the road should be completed. Car builders were set to work repairing the locomotives and cars. Thus every branch of railroad building, making tools to work with, and supplying the workmen with food, was all going on at once and without the aid of a mechanic or laborer except what the command itself furnished.
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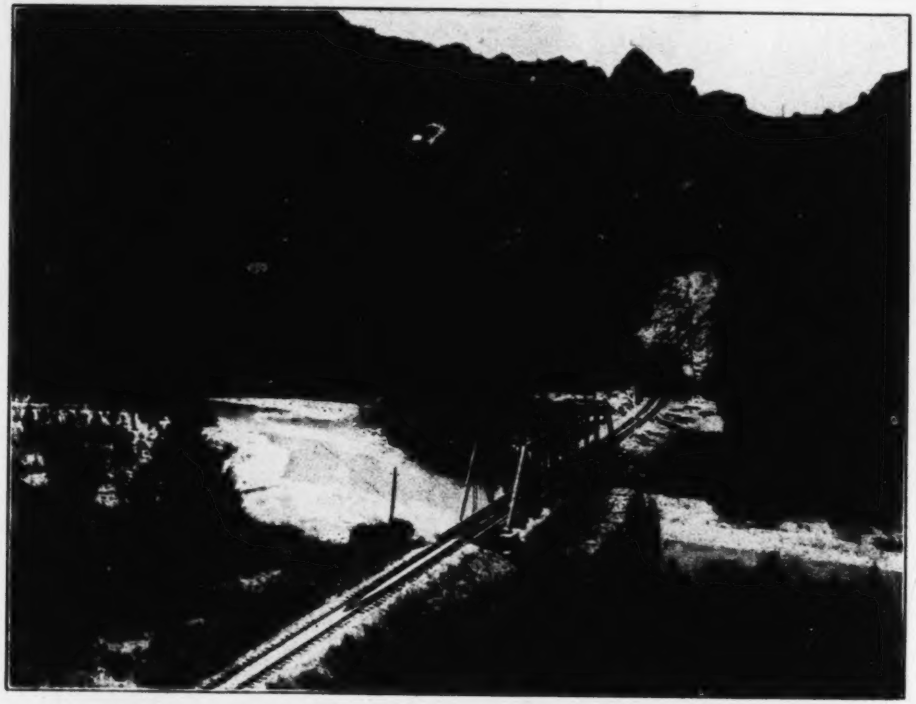
> General Dodge had the work assigned him finished within forty days after receiving his orders. The number of bridges rebuilt was 182, many of them over deep, wide chasms; the length of road repaired was 102 miles.

In 1864, when it came to the Atlanta campaign, most of the railroad work, bridging, etc., was done by organized railroad men under General Wright. My command was called upon only two or three times in an emergency.

I remember when we had flanked the enemy out of the Kenesaw Mountain line, where our extreme right rested on the Chattahoochee River some miles southwest of the railroad crossing, General Sherman came to my headquarters and told me he proposed to flank Atlanta by moving his army to the left. We all supposed he was going by the right. He said to me there was a place called "Roswell Shoals," on the Chattahoochee, where he desired to cross a portion of his army. He said the shoals were shallow, and described



TUNNEL NO. 3, WEBER CANYON, ON UNION PACIFIC RAILWAY.

them to me, asking me how long it would take for my command to build a bridge over that stream. He stated his engineers had told him it was a big job. I looked the matter over and told him "about a week." He seemed astonished, and left me, but in a very short time I received orders from my commander, General McPherson, to move with my corps as rapidly as possible to Roswell, some 31 miles away, and that I would receive orders from General Sherman. We moved and made a march of 31 miles without stopping except for resting our men, and reached there about Sunday noon.

When I arrived there I found that Roswell had several large factories that had been supplying material to the enemy, and I saw if I had the timber in those factories I could soon put up a bridge across the river. The enemy occupied the opposite side, and one of the most inspiring sights I ever saw in my life was when I ordered the celebrated Ohio brigade to ford the river and take the opposite bank. The brigade formed in column with regiment front; the corps bands were brought down to the river; the artillery was placed so as to cover their crossing, and as the boys stepped into the river carrying their cartridge boxes on their bayonets and, with cheers, started to wade across the river, the bands played, the artillery opened fire, and the enemy poured in their volleys. Occasionally a boy or two would strike a hole and go under, but soon came up, and when they got across they rushed for the cover of a cut bank, so the enemy's fire would be less effective. There they re-formed, and charging, soon cleared the works. My pioneer corps now was very effective. It was about 1,500 strong and was organized into squads with a civil or mechanical engineer at the head of every squad. Everyone knew exactly what his duty was, just where and how to go to work, and all I had to do was to give the order. I immediately gave the order to pull down the cotton factories, and on Monday morning you could stand on the bank and see that bridge walk up, so that Wednesday at noon, in three days, I notified General Sherman that it was ready for crossing. He was astonished and sent a proper tribute to the young engineers for their quick work. My official dispatch to him read as follows:

> A footbridge 710 feet long was thrown across the river and from Monday noon, July 10, until Wednesday night, July 12, a good, substantial, double track, trestle-road bridge, 710 feet long and 14 feet high, was built by the pioneer corps from the command.

The cotton factories that I had torn down were claimed by a Frenchman to belong to him; he had a French flag flying over his residence, but not over the factories. On Monday, after we had torn down a portion of one of the factories, my judge-advocate came to me and told me he thought I might be getting into trouble; that this

Frenchman was entering a protest. I had gone too far to stop taking down the factories, but I thought it probably better to protect myself, and communicated with General Sherman, who wrote me a letter dated July 11, as follows:

> HEADQUARTERS MILITARY DIVISION OF THE MISSISSIPPI,
> *In the Field Near Chattanooga River, July 11, 1864.*
>
> GENERAL DODGE, *Roswell, Ga.*
>
> I know you have a big job, but that is nothing new for you. Tell General Newton that his corps is now up near General Schofield's crossing, and all is quiet thereabouts. He might send down and move his camps to proximity of his corps, but I think Roswell and Shallow Ford so important that I prefer him to be near you until you are well fortified. If he needs rations tell him to get his wagons up, and I think you will be able to spare him day after tomorrow. I know the bridge at Roswell is important, and you may destroy all Georgia to make it good and strong.
>
> W. T. SHERMAN,
> *Major-General Commanding.*

You notice that General Sherman was very diplomatic. He says nothing in relation to international law or the French flag, but tells me I may destroy all Georgia to accomplish what I had to do. Of course, I read between the lines, and went on building the bridge.

Sherman commenced crossing his army over this bridge on Wednesday afternoon and made his celebrated flank movement on Atlanta, where the great battles of the 19th, 22d, and 28th of July were fought and Atlanta finally occupied.

Sherman was always profuse in his praise of the young engineers of the army that were continually at work gathering up information for us. I had a very efficient corps for that work under me and Sherman wrote me, thanking me for what I had been sending him, saying he would store it up for future use. This information concerning the streams, the villages, and roads was compiled at his headquarters, printed on cloth, and a copy sent to each corps or division commander and was of great service to us. There was one young man detailed to me, who afterwards became a very noted engineer, Marshall F. Hurd, who enlisted from Muscatine, Iowa, in the Second Iowa Infantry. I soon discovered that he was a genius and of great ability as an engineer, of excellent practical judgment, and very brave. We all tried to get him promoted and a commission given him so he could command officers and men, but we never could accomplish it. However, he virtually got to the head of the pioneer corps of the Sixteenth Army Corps, and the boys all dubbed him a major; and he was known all through the war as Major Hurd, not only by the men of my corps but by the other corps. He would take his pioneer corps out to build entrenchments; he never allowed them to run when the skirmish line of the enemy made an attack, which was often, but they would lay down their implements where they were, take their rifles, and fight it out themselves. He was very resourceful in an emergency. After the war he was connected with us on the Union Pacific and was at the head of some of the surveys both on the Union Pacific and the Southern Pacific, fought battles with the Indians, and when the Canadian Pacific was built he was sent for and went to that work, running some of the important lines over the mountain division. He was the most modest, retiring, unassuming man I ever met. He now lies buried in the cemetery at Denver with a monument raised to his memory and upon it a proper tribute to his great work. I mention him only as one among hundreds of enlisted men who performed such duties.

In May, 1865, I returned to the Union Pacific Railway. Mr. Dey having resigned as chief engineer, I was appointed to that office. General Sherman, in giving me leave of absence to go there and take up this work, said in his letter:

> As soon as General Pope reaches Leavenworth or St. Louis to relieve you, I consent for you to go to Omaha and begin what I trust will be the real beginning of the great road.

Almost the first dispatch when I reached Omaha was one from the commander at Fort Collins, Colo.—he had been with me during my command of that country—telling me that a young man by the name of Eddy had brought in an engineering corps which had a fight with the Indians, and the chief of the party had been killed. I instructed him to have the corps meet me on Lodge Pole Creek, as I was just starting west over the line. I found that Eddy was a young soldier enlisted in the Thirteenth Illinois Infantry, and had served under me in the war. In this fight, after the chief had been killed, he rallied the rest of his party and brought it in safety to the military post.

He stayed with me during the construction of the Union Pacific and also the Texas Pacific; probably many of you know him, as at one time he was general manager of the Southwestern System; he died in the service. I speak of him only as an example of what the engineers, during 1866, 1867, 1868, and 1869, had to face. The line was covered by engineers from the Missouri River to the California state line, and every party was thoroughly armed and had escorts, but many of our best men were killed.

One of the great problems that confronted our early surveys was the crossing of the Black Hills, a spur of the Rocky Mountains. There was no trouble in obtaining a line from the summit of the range and descending to the west into Laramie Plains, but the country on the east dropped off so rapidly there was was no stream nor any divide we could find that was practicable for a 116-foot grade;

the engineers had examined nearly every stream and every divide. The divides from the summit for a long distance down were favorable, but where the division of the granite and sedimentary formations joined there would be a drop of 500 feet in 1,000, and we could not find supporting ground to hold our grade to overcome this great fall.

In 1865, as I was returning from the Yellowstone country, after finishing the Indian campaigns, I took my command along the east base of the Black Hills, following up the Chug Water, and so on south, leaving my train every day and going on to the summit of the Black Hills with a view of trying to discover some approach from the east that was feasible. When we got down to the crossing of the Lodge Pole, I knew the Indians were following us, but I left the command with a few cavalrymen and guides, with a view of following the country from the Cheyenne Pass south, leaving strict orders with the command if they saw smoke signals they were to come to us immediately. We worked south from the Cheyenne Pass and around the head of Crow Creek, when I looked down into the valley there was a band of Indians who had worked themselves in between our party and the trains. I knew it meant trouble for us; they were either after us or our stock. I therefore immediately dismounted, and giving our horses to a couple of men with instructions to keep on the west side of the ridge out of sight and gunshot as much as possible, we took the ridge between Crow Creek and Lone Tree Creek, keeping upon it and holding the Indians away from us, as our arms were so far-reaching that when they came too near our best shots would reach them and they soon saw their danger.

We made signals for our cavalry, but they did not seem to see them. It was getting along in the afternoon, as we worked down this ridge, that I began to discover we were on an apparently very fine approach to the Black Hills, and one of the guides has stated that I said:

> If we saved our scalps I believed we had found a railroad line over the mountains.

About 4 o'clock the Indians were preparing to take the ridge in our front. The cavalry now saw our signals and soon came to our rescue, and when we reached the valley I was satisfied that the ridge we had followed was one which we could climb with a maximum grade within our charter and with comparatively light work.

As soon as I took charge of the Union Pacific I immediately wired to Mr. James A. Evans, who had charge of that division and who had been working on this mountain range for nearly a year, describing this ridge to him, as I had thoroughly marked it by a lone tree on Lone Tree Creek, and by a very steep cut Butte on Crow Creek, and a deep depression in the ridge where the granite and sedimentary formations joined. He immediately made an examination and discovered a remarkably direct line of only a 90-foot grade reaching from the summit to the valley of Crow Creek, near where Cheyenne now stands, and this summit I immediately named for my old commander, General Sherman. The Union Pacific is constructed over this line and it is one of the two 80-foot grades now left on the Union Pacific that they were unable to reduce during the reconstruction of the road.

In building the Union Pacific line it was our endeavor to pass through the town of Denver, which at that time was the center of the mining interest of Colorado. We therefore placed in the mountains a party under Mr. P. T. Brown, a very promising young engineer, who spent part of the summer and most of the fall endeavoring to force his way through the mountains and find a line through the middle park and so on west to Salt Lake. The snow in the mountains was so deep that even in September parties were driven out of the high altitudes. Not receiving very satisfactory reports from this party I joined it in November with a view of endeavoring to cross the mountains at the head of Bowlder Creek at what is now the Hog Back and near where the Moffat Railroad crosses the mountains. We were on this mountain November 7 in a terrific snowstorm, one of the worst I ever saw and one we could not make the mules face. I saw to save the party I would have to abandon my pack train and get into the valley below. We therefore unpacked our mules, cached the packs, and let the mules go. They drifted with the storm. After a day and night's hard struggle with the party we got down into Bowlder Valley about midnight and into a stamp mill that was being built there by Gen. Fitz John Porter, and though we saved the party we did not feel very comfortable from the fact that we had left our provisions and lost our mules and not knowing that we should ever see them again. It is a singular circumstance that on this day I was elected to Congress from the Missouri River district in Iowa, but had forgotten all about the election until several days after. Henry M. Teller, who was then a young lawyer in Central City, and our attorney, sent me several telegrams notifying me that I had been elected to Congress by the largest majority ever given in the district. The mules drifted west into the middle park and around Hot Springs and there wintered very well. In the spring we received notice that they were there and arranged to have them brought in to us; they seemed to be in good condition, and they had lived in that high altitude without food, except what they could get from browsing and the buffalo grass they could graze from under the snow.

In submitting the reports of my chiefs of parties for the year 1866, I said:

> I desire to call the attention of the company, especially to the energy and perseverance with which all of them have performed their duty. Often threatened by Indian attacks, sometimes without escort, and obliged to examine the

country alone, a portion of the time during the winter, they all have had narrow escapes, have had stock stolen, camps attacked, and have been caught in heavy snowstorms, in extreme cold without fires; but as yet we have not lost any lives, nor any stock of great value. In a country, uninhabitated, 100 to 1,000 miles away from any aid, and thrown upon their own resources, their positions have not been sinecures or their responsibilities light. I have never given an order, no matter how difficult to perform, or what the obstacle to overcome, but they have all obeyed it with that energy and personal interest that only under such circumstances can bring success. The young men composing the parties are, as a general thing, far above the average, many of them of fine education, and who not only perform the duty well, but intelligently. To Messrs. Evans, Bates, and House, division engineers, and Messrs. Hills, Brown, Hodges and O'Neil, assistant engineers, who have had charge of parties, I am under special obligations; also to Mr. Van Lennep, the geologist. They are all to take the field for 1867.

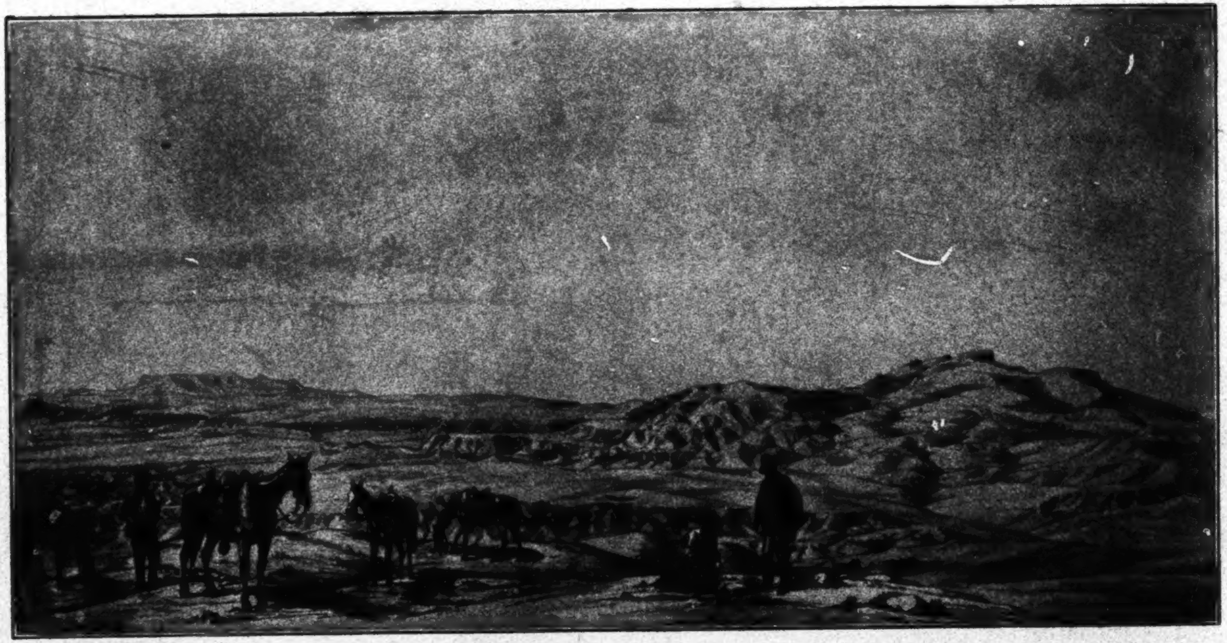
In July, 1867, Mr. Percy T. Brown, whose division extended from the North Platte to Green River, was running a line across the Laramie Plains. His party was camped on Rock Creek, where they were attacked by the Sioux. Brown was out on the line with most of the party, but those in camp were able to hold the Indians off; but a small party out after wood, under a promising young fellow named Clark, a nephew of Thurlow Weed, of New York, was killed with one of his escort, and several of the escort were wounded.

The Indians on the plains were this year very aggressive, and were not satisfied with stealing. Brown, on reaching the divide of the continent, found it an open prairie, extending some 150 miles northeast and southwest and 70 miles east and west. The Rocky Mountains had from an elevation of 13,000 feet dropped down to one of 7,000 feet into an open plain, and the divide of the continent is really a great basin some 500 feet lower than the general level of the country.

Brown, in reconnoitering the country, expecting to find a stream leading into the waters of the Pacific, dropped into this basin, and in exploring it near its southern rim he struck 300 Sioux Indians who were on the war path. He had with him 8 men of his escort, and he immediately took possession of an elevation in the basin, and there, from 12 o'clock until nearly dark, fought off those Indians.

Just before dark a shot from one of the Indians hit Brown in the abdomen. He begged the men to leave him and save themselves, but the soldiers refused to do so. They had to give up their horses, and as soon as the Indians obtained them they fled, and those 8 soldiers made a litter of their carbines and through the tall sagebrush for 15 miles that night they packed Brown to La Clede Stage Station, thinking to save him, but he died soon after reaching the station.

In my examination of the surveys across the plains during 1867 I had with me Gen. John A. Rawlins, General Grant's chief of staff.



DIVIDE OF THE CONTINENT.

Gen. J. A. Rawlins and General Dodge find the Bates party in the Red Desert.

General Rawlins's health was poor; he was threatened with consumption, of which he afterwards died. General Grant wrote me, suggesting that in some one of my trips I take him with me so as to give him the benefit of the high, dry air, which it was a great pleasure to me to do. He came to me with his aid, Major Dunn, Mr. Rogers, and Mr. John E. Corwith, of Galena, and I had Mr. John R. Duff, the son of a director of the company, and David Van Lennep, my geologist. We had as escort two companies of cavalry under Colonel Misner and a company of infantry to guard the trains.

The Indians were very aggressive during the summer of 1867. We were progressing remarkably well with the work when the combined attacks of the Indians along our whole line, not only on our surveying parties far west but on our graders, killing our men and stealing our stock, for a time virtually blocked up our work. I was pushing west with this party to overcome these detentions and reached the Red Desert. We were then in an unknown country, where we expected to find the divide of the continent. We found the basin that Brown had discovered, and while I was preparing to cross this basin I discovered one of my parties, under Mr. Bates, who was running a line from Green River east across the desert. They had been three days without water, and had abandoned the wagons, and were running, by compass, due east as fast as they possibly could in the hope of striking a stream. We discovered them several miles west of us when we reached the rim of the basin, and we first thought they were Indians, but upon watching them closely I discovered they were white men and saw they were in trouble. We made rapidly toward them and found them in a deplorable condition; men nearly exhausted, tongues swollen, and so weakened physically that they could not make much headway. Our opportune finding of them saved some of their lives.

Upon our return trip, after reaching Salt Lake, we followed the Bear River up to its northern bend and on to the Snake River by the Blacksmith Fork to what is known as Grays Lake and undertook to cross the mountains from there directly eastward to the South Pass. The country was very rough. The Government at one time had endeavored to make a short cut from the South Pass to the Snake River by what is known as Landers Cut-off.

When I reached the west base of the mountains I saw we were going to have trouble in getting our trains over. General Rawlins had become quite fatigued in the journey, and I was in the habit of taking him and going ahead of the party, fixing our camp where he would be comfortable for the day, and then bringing up the rest of our party, escort, and trains.

This day I went nearly to the top of the first range, and when we raked away the snow to pitch our tents we found the ground thick with the mountain strawberry. We had seen a good many grizzly bears near Grays Lake, driven from the mountains by the fires, and I left positive instructions for no one to go out and follow a grizzly or attempt to shoot one.

The mountains were so steep and rough I went back to bring up the trains, which had to be hauled up the mountains with doubling up our mules and putting the infantry on prolongs ahead of them. About 4 in the afternoon, after we had gotten the trains over the roughest of the ground, I returned to camp and found Rawlins and Dunn away. I asked the cook where they were, and he said he thought they had gone out to follow a grizzly that had passed by the camp a short time before. I had with me one of our best guides, Sol Gee. Knowing that if they found the bear and shot it there would, in all probability, be trouble, I took Gee and we followed their trail as rapidly as possible. It was but a short time until we heard two shots, and in a few minutes afterwards we saw Rawlins and Dunn coming toward us with the greatest speed. I knew then they had shot at the bear and had wounded him, and he was following them. I said to Sol Gee, who was a sure shot, that I would drop below the trail and attract the attention of the bear as he passed; and if I fired and missed, he must be sure in his shot or the bear would get me.

As Rawlins and Dunn came up I saw the bear was close to them, and I drew the bear's attention, and he turned toward me, giving me a very good shot, but I hit him a little too far back, but did not stop him, and he made for me. Gee waited until he got him face to face and then shot and hit him between the eyes and dropped him. He was one of the largest grizzlies I ever saw. We gave the hide and claws to Rawlins and his friends.

General Rawlins, who was a great stickler in the army for obeying orders and who was sometimes very strong in his language, turned to me and, in his most emphatic language, said we ought to have let the bear get them for their disobeying my orders, but that he was not to blame. It was Major Dunn, who was crazy to kill a grizzly, and he was fool enough to let him try it.

When we reached the South Pass there had been gold discovered just north in what was known as the "Miner's Delight mines." The arrival of such a party with so distinguished a person as General Rawlins drew immediate attention to us, and we were given a lunch and a great deal of consideration. Our guide, Sol Gee, when he got to the towns was apt to drink too much, and when we left after our lunch in the afternoon I could not find him, and I sent Major Dunn

CAMP ON SNAKE RIVER RANGE WHERE GRIZZLY BEAR WAS KILLED.

to hunt him up. I told Dunn under no circumstances to let us get more than 2 miles away before he joined us, because I knew the Indians were in the valley of the Sweetwater and had been doing considerable depredation. We moved on, and I thought no more about Dunn or Gee until we had gone 8 or 10 miles, when I discovered they were not with us. It was nearly night, and we went into camp. I had discovered fresh Indian signs, and I knew they were watching us, and it made me very anxious for the safety of Dunn and Gee. I took half a dozen of the best mounted cavalry with me and went back, supposing they were still at the miner's camp.

I had not gone more than 3 or 4 miles when shots came flying at us from the bowlders in the road ahead. I thought it was Indians and told Guide Adams, who was with me, to seek cover and try to communicate with them. When he called, Gee answered, and when we rode up to them we found Dunn and Gee behind the rocks, thinking that we were Indians. Gee had told Dunn when he heard us coming that their only salvation was to get to cover and fire at us, and that in the night it would probably scare the Indians away.

I asked Dunn why he had not obeyed my orders. He said that when he found Gee he was not able to travel, and, of course, like a good soldier, he could not leave him. After he got Gee sobered up they waited until dark, hoping they could make camp without being discovered by the Indians.

As we moved down the valley of the Sweetwater we met one or two of the mountain men, who informed us that there was a band of Sioux in the Seminole Gap near the mouth of the Sweetwater. I knew these were the Indians that had been doing the mischief all the summer and I was anxious to catch and punish them. Therefore I arranged for our cavalry to go around the Seminole Mountains and cut them off or attack them as we drove them through the gap toward the south. I was certain they had not discovered us and we moved the next morning very early, but the cavalry failed to make connections. The Indian scouts saw us and got word to the Indian camp and they got away, to our great disappointment.

After we got through the gap going south we discovered a small band of buffalo and General Rawlins was very anxious to kill some of them, so I took him and about a dozen of the best mounted cavalry and the guides and moved in toward the North Platte, so as to get to the leeward of the buffalo and also have them between us and the train. I left strict orders with the train if they saw any smoke signs for the troops to immediately come to us. I was suspicious by the action of the buffalo that there might be Indians hunting them. We had passed along about 5 miles and gotten well to the leeward of the buffalo without their discovering us, when all of a sudden I saw a band of Indians hidden on a small stream watching us. I knew that meant trouble, and I immediately prepared for them and made a sign by setting a fire on the ridge for our cavalry to come to us. The Indians, seeing this, thought I was trapping them instead of their trapping me, and after following us for a time got out, and we not only lost the buffalo, but the Indians also.

In the winter of 1867-68 the end of our track was at Cheyenne. During that winter there had assembled there a very large number of people; possibly it was the greatest gambling place ever established on the plains, and it was full of desperate characters. The town of Cheyenne we had claimed, laid out, and leased the lots to the occupants, and organized the local government. There was then no title to be obtained to the town, but we treated this as all the towns, claiming it for the company, laying it out into town lots and not allowing anyone to locate there without taking an agreement from us allowing them to occupy it and agreeing to deed it to them when we got a title.

There had been established there by the Government Fort D. A. Russell, some 2 or 3 miles north of the railroad track, and there was in command Gen. J. D. Stevenson, who had served with me during the civil war. In my absence these desperate characters got together, held a meeting, and jumped the town, refusing to recognize the authorities we had put over the town or in any way to comply with our orders. They had commenced robbing our trainmen and committing other depredations that I knew we must stop or lose all control of the railroad forces at the end of the track. I immediately wired General Stevenson, calling his attention to the condition of affairs and asking him to use his troops to bring about order and a recognition of our authority, and while he had no legal right in the matter he turned out his troops as skirmishers and drove every citizen in the town to a mile or so south of the track and then held a parley with them. He told them that until they were ready to comply with the orders and recognize the authority of the railroad company they should not go back to their property; that really the land belonged to the United States and the railway was occupying it under the Government's charter. This brought them immediately to terms and they immediately made peace, and were allowed to come back to town and we afterwards had no trouble with them. I recite this only as showing the great aid the Government always gave us in building the road.

In the year of 1868 there was a great competition between the Union Pacific building west and the Southern Pacific building east. The Union Pacific desired to at least reach Humboldt Wells, and the Central Pacific's great desire was to reach Ogden. The Union Pacific continued its work over the Wasatch Mountains throughout the winter, which was a very cold and snowy one, and it cost us as much to blast the earth as it did the rock, we paying as high for earth work as $3 a cubic yard.

We laid the track over the Wasatch Range in the dead of winter on top of snow and ice, and I have seen a whole train of cars, track, and all slide off the bank and into the ditch as a result of a thaw and the ice that covered the banks. We built almost as rapidly through the winter as we did during the summer, notwithstanding the short, cold days and long nights, but it was at an immense cost. We estimated that the work during that winter made an extra cost to the road of at least $10,000,000.

The success of the engineers in the surveying and constructing of this road was due mostly to their natural courage and ability. One of the instructions given a party when put into the field was that the chief of the party must absolutely command it and at all times be ready to fight. Another was the importance of never slacking their vigilance, no matter where they were, never being off their guard, and all those who obeyed these orders generally took their parties through. Those who did not were soon relieved in the field or were killed by an attack of Indians. Then again, these engineers were all men of ability, every one of them, as far as I know, has risen to distinction either in his own profession or in some line of business. I know of only two of the chiefs of parties who are still living. One, F. S. Hodges, is a bachelor in Boston, who occasionally goes out to Salt Lake City and gathers together some of his old party, giving them a taste of their old experience by putting them back into camp again with a camp dinner and ending with a great banquet at some prominent hotel. One of his party, Mr. James R. Maxwell, first undertook to locate the line across Salt Lake where the road is now built. When I sent him out, I gave him Captain Stanbury's soundings. The Mormons built him a boat; he put his party into it, and while he was making the sounding of the lake a terrific gale came up that swamped his boat and came very near drowning him and his party, and he reported to me that the lake was 14 feet higher than when Stanbury sounded it in 1849; and it is a singular fact that it was then at its highest known level, for from 1870 until 1900 it continually fell, and when the Union Pacific built the line across the lake it was 11 feet lower than when the original survey was made. The depth of the lake, the weight of the water, and the cost of building was beyond us, and we were forced north of the lake and had to put in the high grades crossing Promontory Ridge.

The other is Mr. James R. Maxwell, living now in Newark, Del. He distinguished himself especially in the building of the Central Railroad in Peru, crossing the mountains at an elevation of 15,666 feet above the sea, the highest railroad in the world. It is of standard gauge. Mr. Maxwell is still able to handle any engineering problem presented to him.

The organization for the construction of the Union Pacific Railroad was upon a military basis; nearly every man upon it had been in the civil war; the heads of most of the engineering parties and all chiefs of the construction forces were officers in the civil war; the chief of the track-laying force, General Casement, had been a distinguished division commander in the civil war, and at any moment I could call into the field a thousand men, well officered, ready to meet any crisis or any emergency. There was no law in the country and no court. We laid out the towns, officered them, kept peace, and everything went on smoothly and in harmony. Two or three times at the end of our tracks a rough crowd would gather and dispute our authority, but they were soon disposed of.

I remember one incident when I was west near Salt Lake receiving a dispatch that a crowd of gamblers had taken our terminal point at Julesburg and refused to obey the local officers we had appointed over it. I wired General Casement to take back his track force, clean the place up, and sustain the officers. When I returned to Julesburg, I asked General Casement what he had done. He replied, "I will show you." He took me up to a little rise just beyond Julesburg and showed me a small graveyard, saying: "General, they all died in their boots, but brought peace."

The work of the engineers on the Union Pacific was a very masterful one. In the beginning they had no reliable maps nor any knowledge of the country, and they explored it until they obtained a line across the country over which one locomotive, then as well as now, could haul as many cars over the line as two engines on any other of the transcontinental lines. They worked summer and winter, rain or shine. My yearly report upon the completion of the road describes better perhaps than I can now what they accomplished, and is as follows:

> They occupied the country extending from the Missouri River to the California state line, and covering a width of 200 miles, north and south, and on the general direction of the forty-second parallel of latitude, some 15,000 miles of instrumental lines have been run, and over 25,000 miles of reconnoissances made.
>
> In 1863 and 1864, preliminary surveys were inaugurated, but in 1866 the country was systematically occupied; and day and night, summer and winter, the explorations were pushed forward through dangers and hardships that very few, at this day, appreciate, as every mile had to be run within range of the

musket, as there was not a moment's security. In making surveys, numbers of our men, some of them the ablest and most promising, were killed; and during the construction our stock was run off by the hundred, I might say, by the thousand; and as one difficulty after another arose and was overcome, in the engineering, running, and construction departments, a new era in railroad building was inaugurated.

Each day taught us lessons by which we profited for the next, and our advances and improvements in the art of railway construction were marked by the progress of the work, 40 miles of track having been laid in 1865, 240 in 1867, and 260 in 1868, including the ascent to the summit of the Rocky Mountains, at an elevation of 8,235 feet above the ocean; and during 1868 and to May 10, 1869, 555 miles, all exclusive of side and temporary tracks, of which over 180 miles were built in addition.

At Promontory Point, north of Salt Lake, Utah, on May 10, 1869, gathered there from the Atlantic and the Pacific the men who made possible this great work. They were the few bold spirits who backed the enterprise with their fortunes, their credit, and their reputation. They spent many millions to meet the clamor and demand of our whole nation for speed, and constructed a railroad 2,000 miles long in three years, when their own interests, their charter, and the Government allowed them ten years to complete the work. So far as it was possible for human to see, as a commercial problem, it had few, if any, advocates. It was simply considered a military necessity. Some day these men will stand in civil life like our leaders in the civil war. The engineers and the workmen stood in groups watching the preparations for the driving of the golden spike which should tie together with iron bands this continent. The locomotives from the east and from the west were run together and each engineer broke a bottle of champagne on their comrade's machine, and a great glorification of the event was celebrated all over the country. On that day, General Sherman, not forgetting the engineers and pioneers of this work, sent me this dispatch:

WASHINGTON, *May 11, 1869.*

GEN. G. M. DODGE:

In common with millions, I sat yesterday and heard the mystic taps of the telegraphic battery announce the nailing of the last spike in the great Pacific road. Indeed, am I its friend? Yes. Yet, am I to be a part of it, for as early as 1854 I was vice-president of the effort begun in San Francisco, under the contract of Robinson, Seymour & Co. As soon as General Thomas makes certain preliminary inspections in his new command on the Pacific, I will go out and, I need not say, will have different facilities from that of 1846, when the only way to California was by sail around Cape Horn, taking our ships 196 days. All honor to you, to Durant, to Jack and Dan Casement, to Reed, and the thousands of brave fellows who have wrought out this glorious problem, spite of changes, storms, and even doubts of the incredulous, and all the obstacles you have now happily surmounted.

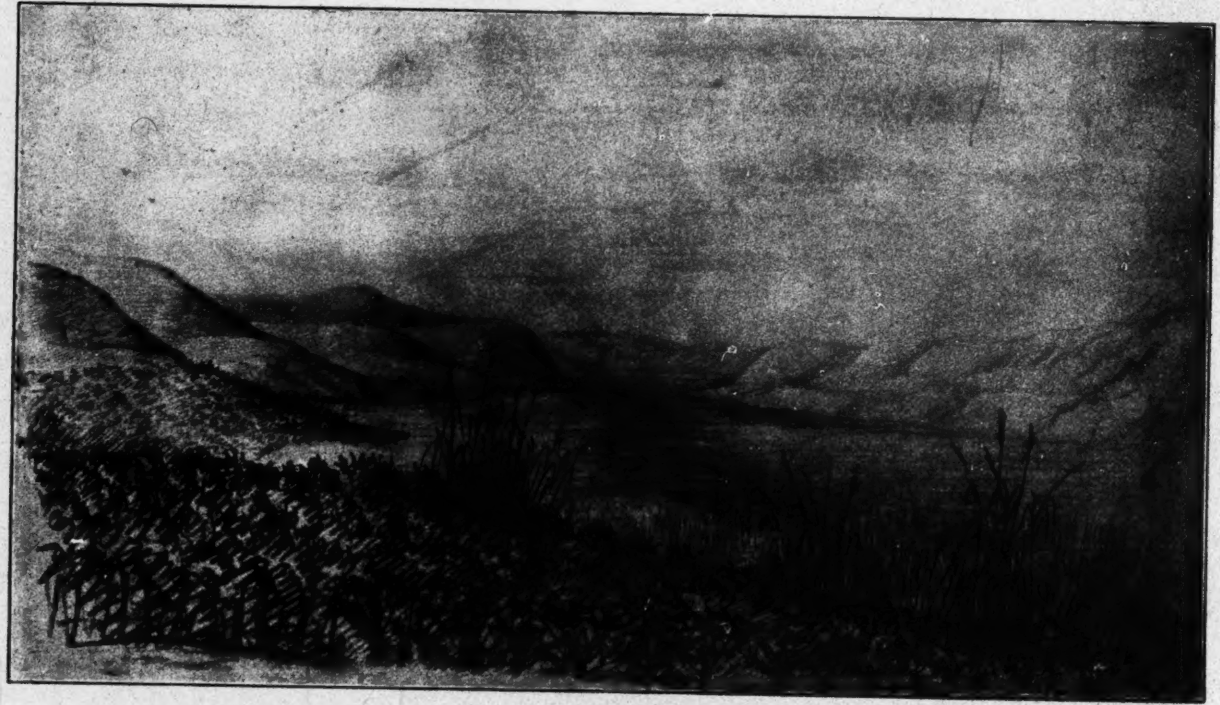
W. T. SHERMAN, *General.*

How well all did their work I leave to the distinguished commission of engineers appointed by act of Congress to examine, review, and report upon the completion of the Union Pacific Railroad, which is as follows:

> Taken as a whole, the Union Pacific Railroad has been well constructed. The general route for the line is exceedingly well chosen, crossing the Rocky Mountain Ranges at some of the most favorable passes on the continent, and possessing capabilities for easy grades and favorable alignments unsurpassed by any other railway line on similarly elevated grounds. The energy and perseverance with which the work has been urged forward, and the rapidity with which it has been executed are without parallel in history. In the grandeur and magnitude of the undertaking it has never been equaled, and no other line compares with this in the arid and barren character of the country it traverses, giving rise to unusual inconveniences and difficulties, and imposing the necessity of obtaining almost every requisite of material, of labor, and supplies for its construction, from the initial point of its commencement.
>
> G. K. Warren, *Brevet Maj. Gen., U. S. A.*
> J. Blickensderfer, Jr., *Civil Engineer,*
> James Barnes, *Civil Engineer,*
> *Special Commissioners Union Pacific Railroad.*

In the last five years the Union Pacific and the Southern Pacific have been virtually reconstructed under the able management of Mr. E. H. Harriman. The Union Pacific in bringing its grades to a maximum of 47 feet per mile, excepting the 80-foot grade rising the mountains from the east at Cheyenne, and the 80-foot grade rising the Wasatch Range west from the town of Echo, and in shortening the line some 30 miles, has spent almost, if not fully, as much money as it took to construct the road; and the distinguished engineer who had charge of that work is now the chief engineer of the Rock Island system, and he pays this tribute to the engineers and builders of the original line:

> It may appear to those unfamiliar with the character of the country that the great saving in distance and reduction of grade would stand as a criticism of the work of the pioneer engineers who made the original location of the road. Such is not the case. The changes made have been expensive and could be warranted only by the volume of traffic handled at the present day. Too much credit can not be given to Gen. G. M. Dodge and his assistants. They studied their task thoroughly and performed it well. Limited by law to a maximum gradient of 116 feet to the mile, not compensated for curvature, they held it down to about 90 feet per mile. Taking into consideration the existing conditions thirty-five years ago; lack of maps of the country, hostility of the Indians, which made the United States troops necessary for the protection of surveying parties, difficult transportation, excessive cost of labor, uncertainty as to probable volume of traffic, limited amount of money, and necessity to get the road built as soon as possible, it can be said, with all our present knowledge of the topography of the country, that the line was located with very great skill.



HUMBOLDT WELLS.

On line of Union Pacific Railway survey, July, 1868.

Since the public statements of Mr. Harriman and this tribute by Mr. Berry, we have heard no more talk of the unnecessary miles of road that were built for the purpose of obtaining the Government subsidy.

Upon completion of the Union Pacific Railroad I was called upon by the Pennsylvania Railroad interests to organize the construction company and build the Texas Pacific Railroad from New Orleans to San Diego, Cal., and in 1871 we marshaled our forces and covered the line with engineers from Marshall, Tex., to San Diego, Cal. We were in the same condition in this work that we were on the Union Pacific; without any railroad connection, depending upon the Red River for our supplies and materials, and, of course, that river went dry, but nevertheless the engineers pushed on into the country where they had the Indians, among many other difficulties, to contend with. I put Hurd's party into the most difficult Indian country. He had not been there very long before I received a letter from the governor of the State telling me that Hurd had attacked and killed some of the friendly bands of Indians out at what was known as Sulphur Springs at the foot of the Staked Plains. Hurd was too far away for me to communicate with him, but I sent him the governor's letter. He was a man of few words; his work always told for itself in his maps and profiles, and he answered the governor's letter in a very short response, which he sent me to approve and forward. In it he stated that the Sulphur Springs was the only water within 50 miles of him; when he reached there it was held by the Indians, and they refused to let him have any water or allow him to approach the springs. They would not even sell it to him, and he said:

> Of course I took the springs. I don't know whether I hurt any Indians or not, and I do not care, but I knew better than to go back to General Dodge and tell him that I had been forced to abandon my survey by two or three hundred barebacked Indians without fighting them.

That was the last I heard of that complaint.

On the line through Arizona we had a very noted engineer, Capt. R. W. Petriken. He was a graduate of West Point and had been in the Engineer Corps during the war. He resigned and took service with the railroads, intending to follow railroading as a business, believing there was greater possibility in it for him than in the army, but he was killed after a long fight with a band of Mexican Indians.

In building the Texas Pacific we went through an epidemic of cholera and one of yellow fever, and were subject at every town and every county line to shotgun quarantine; and notwithstanding that most of the engineers were from the North, they all stayed on the work.

I remember in 1873 when we were rushing to close the tracks in Texas, coming from the East and West to save our land grant, the epidemic of yellow fever was upon us, and every morning those of us who were at the end of the track could see numerous corpses taken out of the working gangs and buried in the dump, and it took a brave, determined man of great moral courage, who was under no obligations except that of duty, to stay and fight it out.

I remember one young engineer who was setting grade and centers for the track layers. He lived in the cars that housed the convicts that were laying the track, who, no matter how much they wanted to leave, could not; he went out on his work promptly every morning and could see the progress of the fever by the number of convicts taken out and buried in the dump, and that it was only a question of time when it would have him in its grip. I thought it possible he might leave us, so one morning I walked out and spoke to him, asking him how he and his men were feeling. He said very quietly they had considered the situation, and they proposed to stay on the job until we connected the tracks, but he stated:

> Then I shall start on the first train for God's country and never shall come back to this.

I thanked him for his determination to stay, and he stated that he had been employed on the job for the season and he did not propose to run because some others had; he was a specimen of the engineers who went South with us. A great many of them had the yellow fever; some of them died, but they all showed an esprit de corp and an interest in the enterprise that would be a good object lesson to many who are on similar work to-day.

As soon as the tracks were joined I gave all the engineers who had come from the North a leave of absence, but very few of them took advantage of it.

During the years from 1870 to 1874 the line was determined and located through to California. Work was commenced at San Diego and some 500 miles was built during that time in Texas, but the Jay Cook failure stopped us, and it was not completed through to California until 1883, and to-day three of the great railroads of the country occupy the line that was intended at that time for only one. They are the Texas Pacific, the Southern Pacific, and the Santa Fe. It is a singular fact that the same engineers and the same foremen who had joined the tracks at Promontory Point in 1869 met on the plains at Sierra Blanco, Tex., in 1883, and joined there the tracks that united the second continental line across the continent, but under entirely different circumstances. There were no bands, no crowds, no speeches, and no champagne. It was simply the engineers and foremen of the track-laying forces that shook hands at this great event, and it created very little notice or comment.

There has been a general belief throughout the country that it was a very easy problem to build a railroad; that the railroads were overcapitalized, which recent investigation has demonstrated to be untrue. In my travels I have seen men riding in a Pullman car that carried a valet, a maid, a porter, and a conductor, which these people generally kept busy all the time, look out of the window and express the opinion that it was easy work or virtually no work to build a railroad through the country they were passing, and make comments on what it represented and what it should cost, and I often used to think as I listened to them, if they had the experience of the builders; first, as chief of a party to spy out a line, perhaps alone in an Indian country; then followed by the young engineer, carrying a rifle on one shoulder and a transit on the other, camping where his day's work ended; then the bold spirits who furnished the money to first construct the road, that would need probably to be carried ten or twenty years before it brought any income, and then by the operating department, who had to reconstruct it two or three times and put millions upon millions into it to bring its commercial business and the luxury of its transportation up to our date, he would take an entirely different view of the enterprise.

I thank God that the criticisms of the years have finally aroused the railroad world to educate the people and demonstrate to them what the transportation of this country has cost in lives, labor, and money, and what benefits it has brought to the nation.

UNITED STATES DEPOSITORY

CHIEF ENGINEER'S OFFICE, UNION PACIFIC RAILWAY, OMAHA, NEBRASKA, 1866–1870.

ADDRESS AT A BANQUET OF THE COMMERCIAL CLUB, OMAHA, NOVEMBER 10, 1906, GIVEN IN HONOR OF MAJ. GEN. G. M. DODGE AND MRS. JOHN A. LOGAN.

At a banquet given by the Commercial Club, at Omaha, on November 10, 1906, in honor of Maj. Gen. Grenville M. Dodge and Mrs. John A. Logan, in replying to remarks of Dr. George L. Miller, General Dodge made the following response:

It must be evident to all present how embarrassing it is to me, and how difficult it is to express my thanks for all the kind words and compliments that have been paid me. Omaha and Nebraska have always had kindly feelings toward me, and never let an opportunity pass to show it, and when I see surrounding me so many of my friends and supporters in my young days, when I was struggling here to build and develop an empire, I feel that it is impossible to thank you as you deserve.

You must appreciate the fact that when two old friends like Doctor Miller and myself get together, that as the years go by the appreciation of each other grows in geometrical progression. The credit that he gives me belongs largely to others, who spent their time, their brains, their money, and their credit in developing the country west of the Lakes.

As you all know, since I was 19 years old my entire life has been spent in the upbuilding and development of the country west of the Lakes, and in the line of my profession it has been my great good fortune to know and be with the groups of men whose time, credit, and fortunes have been spent for the increasing of population and in making an empire, where, when I began, there were only 50,000 people in Chicago, and not many more than that from there west to the Pacific. These men have never received the credit they were entitled to. I have in mind four groups in this work, and I will name them.

The first were Farnam & Sheffield, who built the first road west of Chicago to the Mississippi River, one of whom you have honored by giving his name to one of your principal thoroughfares. On the completion of this work Mr. T. C. Durant joined Mr. Farnam in building the Mississippi and Missouri Railway, now the Rock Island, across Iowa.

The next were the Ameses and their New England following, and to them monuments should be raised, as it was to their nerve and the use of their unlimited credit that is most due the success of the Union Pacific, and I never look back upon their work that I do not consider the act of Congress, which drove Oakes Ames out of their halls and to his death, one of the most unjust acts ever passed by Congress, when he should have had their thanks and the credit due him, and which some day he will receive for his unfailing support of us all who were engaged on that great work. Very few of you know how many times we were close to failure and he saved us. I remember once when I wrote Oakes Ames that we must have money or the work would stop, that he answered to go ahead, that it should not stop if it took the shovel shop to keep it going. Again, when the question came whether the credit of the company should be impaired or that the standing and credit of the Ameses should suffer, he said: "Stand by the company and let the Ameses take care of themselves," and their commercial standing and credit did suffer. It was these men, aided by Dillon, Durant, and their following that were the pioneers along the forty-second parallel of latitude, and to whom our great prosperity to-day is mostly due.

The next group was headed by Thomas A. Scott in that great development of the Southwest, and in projecting and partially building the Southern Line to the Pacific. He was surrounded and supported by that remarkable body of men identified with the interests of the Pennsylvania Railway. They were Thompson, Roberts, Walters, Houston, Baird, McCullough, and others, the descendants of whom are prominent in all the affairs of the Pennsylvania to-day. In the three years' work on that line they had spent $10,000,000 without selling a bond or share of stock. The Jay Cook failure came and halted the work. Scott was in England and had raised the money to take us to the Pacific and the papers were waiting a final signature, when like a clap of thunder out of a clear sky came the failure of Jay Cook and virtually put the whole crowd in bankruptcy. We were all called to Philadelphia. I owed more than a million of dollars in Texas and the shock was so far-reaching that it stunned everyone. I remember this group of men stayed all day and nearly all night in Scott's room at the Philadelphia headquarters and considered and discussed the situation. The question was, Shall we save the property or ourselves? I told them of the outcome of a similar meeting when Ames said, "Save the road and let the individuals go to the wall," and Scott answered that is what we will do, and these men sat down and assumed the entire debt of $10,000,000 or more, putting out their individual notes, known as the five-name paper and the three-name paper, part of us signing the five-name paper and the more wealthy and those of better credit the three-name paper. This was a pretty bold movement, when not one of them could really say or know whether at that moment he was worth one cent. After signing these notes they distributed them to each one of us to take them to such financial institutions as we might know and to try to sell them. One million was assigned to me of the five-name paper, of which I was a signer. I had no idea where I could raise one cent on it. I thought everyone would look upon us and our credit as I knew our financial condition to be and would judge the value of our notes accordingly. I took mine to New York City; I considered it to be the hardest and most uncertain problem that I ever had to solve. I had in New York a long time a small account with Gilman & Son, prominent private bankers. I called on them as soon as I reached New York, and met Mr. Gilman, a very astute, clear-headed, calculating banker, and showed him the paper. He read the five names, looked up to me and said, "Why, that looks like pretty good paper; I think our clients would like to have some of it," and asked me to leave it with him. You can imagine my feelings, and how my barometer went up. I immediately handed over to him the million. The next day when I went to see him he stated that they would take it and asked if I could get any more. I saw then what it was to a man to have a good name, a good business standing, and good credit, and I have never forgotten it. That paper was all paid off before it was due. Our work halted then in Texas from 1874 until 1880, when Mr. Scott becoming sick induced Jay Gould to buy his interest. Mr. Gould and his following then took hold of the property and built from that time on what is known as the Southwest System, some 10,000 miles of road. He, like the rest of them, planted his money and his credit to build up and develop a partially inhabited country, but did not live to see the full fruition of his plans, but his children have. With Mr. Gould and his associates I was connected from 1874 to 1884, and I take pleasure in paying my tribute to him and giving him the credit he is entitled to, for he was more abused, slandered, and vilified than all the rest combined. He spent his life in opening up a vast territory to the new population without receiving any immediate benefit from his investment, but it proved that his judgment was correct. Personally I never was with a more reliable and considerate man than Jay Gould. I spent many, many millions in building the Southwest System, but as far as I know I never had a dozen letters from him. Everything was done by word of mouth or by telegram. When we discussed any question and came to a conclusion and Mr. Gould said, "General, we will go ahead," or do this or that, no matter what it meant or into what difficulties we got, I never had doubts as to where Jay Gould would stand. He never went back on the support of me or tried to evade, as some others did, the responsibilities he had assumed. When the projects looked unprofitable, he had plenty of opportunities to avoid great losses, but he stood by, no matter who deserted, and when I compare where he put his brains and millions with those who have criticised him so severely, who would not invest a cent, except it was secured and brought a safe interest, but he year after year had new faith in the future outcome of our interest in the West, I feel it was to him that was due the credit instead of the criticisms. I learned the value of the brains, push, and combinations of Jay Gould, and I say all honor to him, and you of the West should revere and honor his work and name.

The third group was the California giants, Huntington, Stanford, Hopkins, Crocker, and their associates. Their work on the Pacific was a duplicate of Ames, Scott, and Gould, and though at times we were in sharp competition, in long, bitter fights, I had the personal friendship of all of them. Their leader was Huntington, and he was a wonderful man. For years we were in sharp competition, but you may hunt the records of all he either said or did and you won't find a word uttered against me. He always spoke in the highest terms of me, even when it hurt his own case, and in after years we were close friends. He was a great man, and has built great monuments to himself from the Atlantic to the Pacific. I remember, I think it was in the eighties in one of the financial panics, we were both borrowing large sums of money from the same bank in New York. The companies I was connected with were weak, while his were very strong financially, and when the bank called upon us for additional security we could not always put it up promptly. One day the bank called upon us for quite a large addition to what we had up for one of our companies, and I told them it was impossible for us to meet the demand, and they said they would be obliged to sell out our loans, and I was in great distress, for I knew it meant bankruptcy for the company. They said that when they called upon Mr. Huntington for additional securities he would bring down double for what they asked. That evening I met Mr. Huntington and told him our troubles and what the bank said. His eyes brightened. He said: "Sell you out, will they! Well, that is just what we want, and is what we have been trying to do ourselves for six months." He said: "General, you go down in the morning and tell them if they can sell your securities to do so, and when they get through let them sell mine." I saw the point; I called at the bank, told them that I was at the end of my rope and to sell, and when they got through selling mine, Mr. Huntington said to sell his. That settled that question, and their efforts from then on were not to try to squeeze us, but to help us through. The fact is, there was no sale for any security, which Huntington and the bank knew.

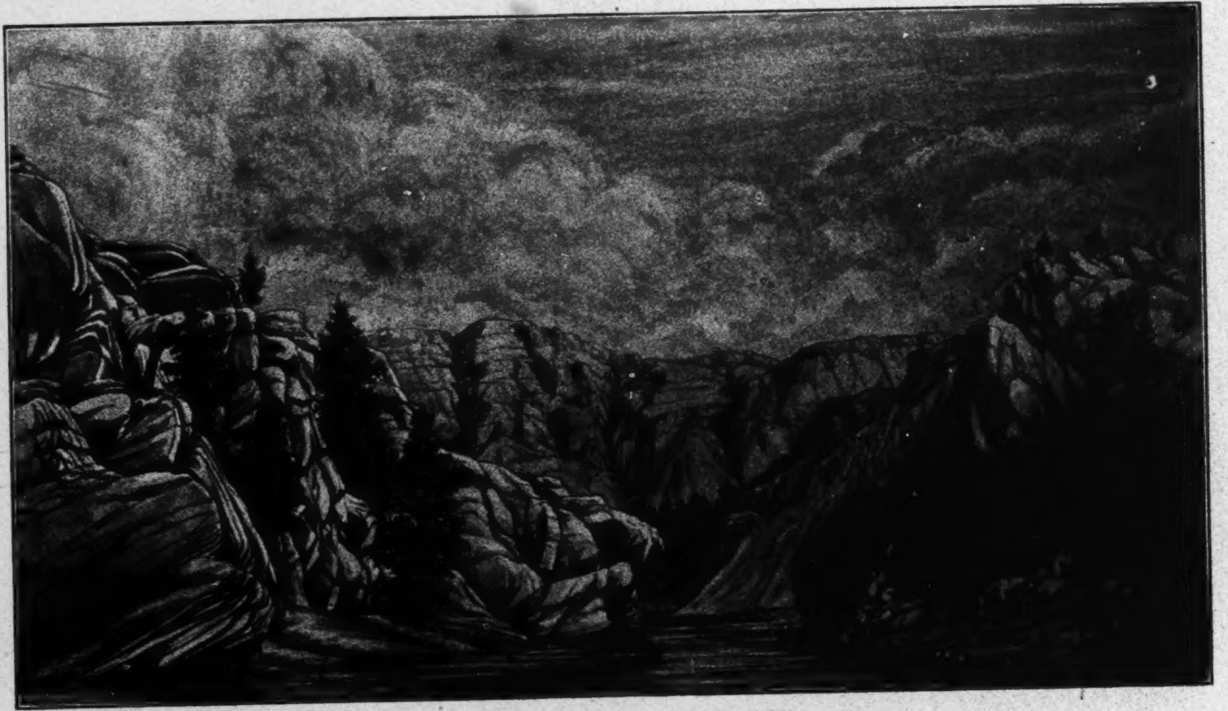
The groups of men I have mentioned have never received the credit that they were entitled to and the great field of their work should remember them and monuments should be raised to their memory.

I see Mr. Meeker is here trying to raise monuments to mark the old Oregon trail which I have traveled over so many times, but the men that I have mentioned have marked it with bands of steel, and now it reaches from the Missouri to the Pacific, and you can stand beside it at any place during any hour of the day and you will see trains, passenger and freight, passing, and they have made it the most noted route of transportation in the world. I hope Meeker will succeed in raising monuments for the old wagon trail; it is commendable to try to pass into history the work of those crossing the continent in '49.

Now comes the group of workers following and sustaining the efforts of the great men I have mentioned. Every community has them; right here in Omaha you have many noted ones. I see some around this table. Who has forgotten the work of Dr. George L. Miller, who all his life was working to build up this country and whose support and friendship is so dear to me? With him were Saunders, Hanscom, Hitchcock, Morton, and hundreds of others, and the new generation that is coming after us should never let their work and names be forgotten.

I have detained you far longer than I intended, but when you say a word about these early great events you never know when or where to stop, and once more I thank you from the bottom of my heart.

It is a great pleasure to have here with me and to see you honor the wife and daughter of that comrade of mine who in war and peace was such a great friend. No matter whether it was his magnetism in battle or his eloquence in Congress, in all the years I knew him he was ready with both to aid and defend me with any work I was engaged, and his good wife stood by to do more if possible, and no one honors more than I do the memory of my old comrade, John A. Logan, and no one is truer to me than his good wife and his family.



ENTRANCE TO NORTH PLATTE CANYON.

Through Seminoe Mountains near mouth of Sweetwater Creek. General Dodge, General Rawlins, and Orderlies.

ADDRESS AT UNVEILING OF MONUMENT TO MAJ. MARSHALL F. HURD, DENVER, COLO.

Marshall Farnam Hurd was born in Scipio, Cayuga County, N. Y., in 1823. His father married Abbie Farnam, sister of Henry Farnam, of New Haven, Conn., the builder of the Rock Island Railroad, and under whose auspices the first surveys were made for the Union Pacific Railway in 1852–1860.

Hurd's father and mother died within a few months of each other, leaving three small children—Irwin Newton Hurd, afterwards a Presbyterian minister, now deceased; Florence A. Hurd, afterwards Hoyt, deceased, and Marshall Farnam Hurd, a baby only a few months old.

The children were separated, and Marshall Farnam Hurd was brought up in his uncle's family. The uncle was a noted engineer in New York, and had charge of the Lockport Locks in the Erie Canal, also of much other work in the State of New York. From him Hurd obtained his education and practice as a civil engineer. His first work in his profession was in New York State, and afterwards on the Rock Island Railroad in the State of Illinois. At the beginning of the civil war he was at Muscatine, Iowa.

On July 24, 1861, he enlisted at Burlington, Iowa, in Company I, Seventh Iowa Volunteers. On August 23 he was transferred to Company A. On August 25, 1861, he was promoted to fourth corporal, and on July 28, 1863, was made second corporal. He was taken prisoner November 7, 1861, at the battle of Belmont and was exchanged October 17, 1862. He was mustered out of the service August 9, 1864, by reason of expiration of his term of service.

I first knew Hurd at Corinth, Miss., in the fall or winter of 1862, where I was in command. I called for details from the different commands for engineers. Hurd was one of the men that reported to me, and I put him in charge of a portion of the force that was building fortifications around Corinth. From that time until he was mustered out he followed his profession in the army, especially in the work which fell to the Sixteenth Army Corps in rebuilding the Memphis and Charleston, Nashville and Decatur, Mobile and Ohio, and other railroads. Realizing how competent he was as an engineer, every effort was made by myself and my superior officers to have

Hurd given a commission, but, being detailed from his regiment, he could get no indorsement from it, and we failed to obtain a commission for him from the United States; therefore he served all the time, although only an enlisted man, as civil engineer in charge of men, and even officers. Everyone recognized him as a commissioned officer, many, I believe, not even knowing that he was not commissioned. He was called "Major," and the engineers of the other corps and divisions he came in contact with always recognized him and treated him as a commissioned officer. He was especially efficient in throwing up entrenchments in front of the enemy. He was utilized mostly by the Sixteenth Army Corps, although often detailed by the commanders of the army with the Sixteenth Army Corps Pioneer Corps, which consisted of about 1,500 detailed men and negroes, and was probably the most efficient construction corps in either Grant's or Sherman's armies. He was known throughout the army as an officer who, when he was on the line building intrenchments under fire, no matter what the circumstances were, stayed with his work, however fiercely attacked. He turned his pioneer corps, largely made up of enlisted men, into fighting men, and whenever we saw him come from his work with any portion of his pioneer corps when attacked, we knew it was because he was driven out by a superior force. Other pioneer corps would often come out when simply attacked, not being able to hold their men to the work, but Hurd never did, and in this way he became favorably known in the Army of the Tennessee.

Hurd left me in August, 1864, in front of Atlanta, to be mustered out. Not being able to obtain promotion, he went back to his profession and began work on the Union Pacific Railway under S. B. Reed, who was division engineer of the road at that time. After the war, in 1866, I found Hurd upon the Union Pacific Railway, and during the construction of the work he was used almost entirely in the construction forces. Mr. S. B. Reed had charge of the construction work for the contractors, and Hurd generally worked under his direction, though at times he was used to examine and make difficult locations.

When I was building the Union Pacific Railway in 1867 Hurd had charge of the division crossing the Black Hills from Cheyenne west, and one time when I was in Cheyenne he started out with provisions for his party. I gave him a company of Pawnee Indians, who were on the line as escort for engineering parties and construction forces with me. Accompanying him was Silas Seymour, consulting engineer of the Union Pacific Railway. When they reached what is known as Granite Canyon the Pawnees discovered a party of Crows who had just stolen the stock from one of the grading camps, and they

THOUSAND-MILE TREE, WEBER CANYON.

On line of Union Pacific Railway survey.

immediately left Hurd with his teams and provisions and started for the Indians. Hurd saw nothing more of them, but there were other Indians near him and he immediately corralled his train and prepared to protect it with his teamsters, sending word to me where he was and how he was situated. The Indians saw his preparations and did not attack him. A force was sent to his aid and he moved on. The Pawnee Indians returned to Crow Creek, where Cheyenne is now located, bringing with them several scalps, and evidently expecting great praise for what they had done, and when I censured them for deserting Hurd they were utterly disgusted, but they made the nights hideous for a week with their war dances over their fights and scalps.

When I left the Union Pacific Railway to go to Texas to take charge of the building of the Texas and Pacific Railway I took Hurd with me and placed him in charge of the party that was to make a survey across the Staked Plains to El Paso, knowing that it would be a difficult country and dangerous on account of the roaming bands of Indians that were upon it. Hurd, with his party, reached what are known as Sulphur Springs, at the foot of the Staked Plains, and found a band of Indians in charge of those springs. There was no water from that point to the Pecos River. some 150 miles away. Hurd opened negotiations with the Indians with a view of obtaining water, but they refused to let him have it, and he immediately formed his party, which was armed, and made an attack upon the Indians, and drove them away from the place. There were at least 200 of them. Hurd made no report of this to me, but a complaint was made to the governor of the State of Texas, who sent to me for an explanation. As soon as I could reach Hurd I sent the complaint to him, and he answered it with a few lines. He said that he found the Indians there, and that they would not share the water with him or allow him to go to the springs, so he attacked them and they immediately ran away. Whether he hurt any of them he did not know or care. He said he knew it would never do for him to return to me and make a report that he could not obtain this water, unless he had made an effort to do so. His reports on his work were always short, giving but little description unless instructed to do so. He always relied upon his maps and profiles to indicate his work.

After the completion of the Texas and Pacific surveys in 1874, Hurd went north and was employed upon different roads. In the eighties he, with his uncle, S. B. Reed, was employed by the Canadian Pacific Railway in locating lines over and through the mountain division, and much of his work there stands as remarkable examples of mountain location, and a part of the Canadian Pacific Railway crossing the Rocky Mountains is built upon lines that he located.

In 1886, when I commenced extending the Fort Worth and Denver City Railway to Denver, after putting my forces in Texas in the field, I went to Denver on the cars in the spring of 1887. As I stepped off the train the first person I saw standing on the platform was Hurd. We were both astonished to meet each other. The first question I asked Hurd was what he was doing. He answered that he had just come off some survey, and was at liberty. I told him to immediately proceed to Trinidad and get an outfit and make a reconnoissance for me from the Atchison, Topeka and Santa Fe Railway east along the summit of the Raton Range, and find me the best pass over that range of mountains on as direct a line as possible from Trinidad to Tascosa, Tex., and to be ready to report to me within two weeks in Trinidad. When I drove through to Trinidad I found Hurd waiting there for me. He said that he had found a good pass and believed he could locate a line through the mountains on a 1 per cent grade. I told him to organize a party immediately and make the location, and he accompanied me through what was then known as Emory Gap to show me the line he had selected. I approved it, and he made a remarkably fine location with a 1 per cent equated grade.

After the completion of this work Hurd was employed on some of the surveys in the Rocky Mountains for other companies until his age became such that he could no longer keep the field.

In 1874 Hurd married Maggie Fitzsimmons at Ottumwa, Iowa. She died in 1886 and is buried in Ottumwa. She was a lovely, good character, a great comfort to Hurd, and her death was a severe loss to him. Only a few months after the death of his wife his sister, Mrs. Hoyt, died. She was always very near to Hurd, and the double loss was very hard upon him. He said at the time, " I wonder who will be with me when I go."

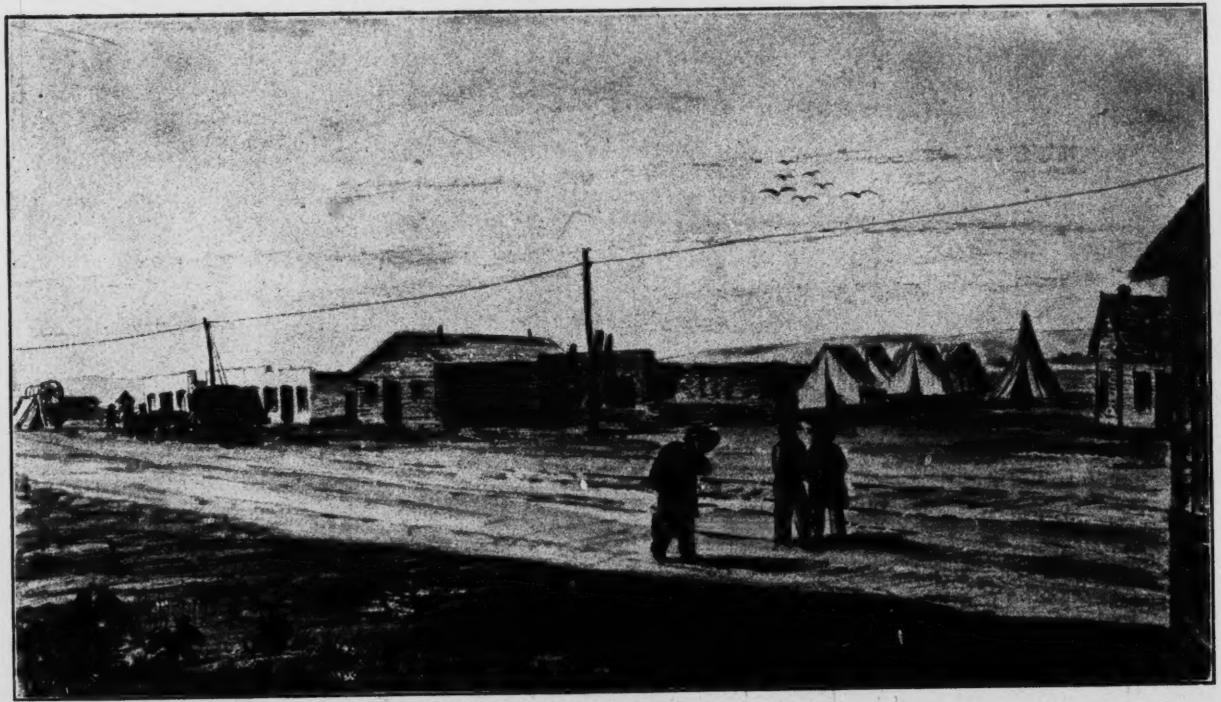
Hurd lived simply; he was never a money maker. He never seemed ambitious to make money, only to do his duty in whatever position was assigned him; never was particular about his salary, taking whatever was given him. His reputation in camp was that he could keep and ration a party on less money than any engineer that was ever in my service. It was said of him that all he needed to keep himself alive was tobacco. I remember in driving across the country in 1887 from Trinidad to Tascosa, Tex., that the person I had assigned to put up the provisions for us had provided only sandwiches, which, of course, became so dry in a few days that we could not eat them. I expected to obtain something for my party to eat when I reached Hurd's camp. When I arrived at the camp Hurd was out on the line, but I asked the cook if he had anything to eat, and he said " No; " that they had just sent the teams to Trinidad for provisions. I asked why they had not sent before, and he said the reason was that the " old man" had not run out of tobacco, and was never known to send for provisions so long as tobacco lasted, so we had to continue on our trip, living upon an antelope that I happened to kill the next day, and occasionally a few birds that we shot on the prairies.

Hurd was always held in high esteem by all the engineers he worked with. He was very modest and reticent, and it was hard to keep him in conversation, but his work was always complete and satisfactory, and he would work a party longer and under more difficult circumstances than any engineer I ever knew.

It is seldom that the work of such a man as Hurd is recognized. People forget that it is the brains, energy, and self-sacrifice of such men that have developed the great West and made it the empire it is, and it is for this reason that I have felt that the simple tribute I pay him is due to him for his long and faithful service with me.

During the latter part of his life the home of Hurd was in Denver, and it is in that city that he was laid to rest. His grave is marked by a simple shaft, the inscriptions on which record concisely the work of his life. They are as follows:

> Marshall Farnam Hurd. Died March 4, 1903, aged 80 years. Enlisted in Company A, Seventh Iowa Volunteers, August 28, 1863, and served during the civil war. A brave, able, and faithful comrade; a prominent civil engineer, modest but never failing to accomplish any work he was assigned to. Many of his mountain railway locations will stand as a monument to his skill and adaptability to such difficult work.
>
> Engineer Second Division, Sixteenth Army Corps.
>
> Division engineer, Union Pacific Railway, Texas and Pacific Railway, Canadian Pacific Railway, Fort Worth and Denver City, and other railways.
>
> This monument is erected by his comrade, Maj. Gen. Grenville M. Dodge in testimony of his many years of loyal and faithful service under him.



JULESBURG STAGE STATION, WYOMING, 1867.

ADDRESS ON "THE PIONEERS AND DEVELOPMENT OF THE WEST."

Given at a Banquet March 10, 1906, in Omaha.

When a voice called me up on the telephone and informed me that this club desired to give me a luncheon at which I could meet some of my old friends, I was surprised and rather objected, but the voice took me back to early days, and I thought if those who were with me then carried their friendship so long and desired to see me, it was a great honor and satisfaction to me, and I accepted with great pleasure.

Naturally, when I meet you here under such circumstances my mind carries me back to the early fifties, when there was no Omaha and no Nebraska. The first time I crossed the Missouri River, with a small engineering party, I was greeted on this side by Indians. No white man lived here and no one in my party probably had ever seen an Indian before. My duties as chief of the party were to look up the country ahead, and the young boy who ran the party is a citizen to-day of Omaha. He was with me many years, an able, conscientious, hard-working, faithful man, to whom I owe much, for he faithfully filled all his positions. He is well known in this city, and I am glad to say has been honored by it; I speak of Mr. J. E. House.

I rode out to the Elkhorn River alone, leaving House to follow. On arriving at the Elkhorn I was tired, unsaddled to give my horse a chance to graze, and lay down to take a nap. I was aroused by the neighing of my horse, and looking across the valley saw a Pawnee Indian taking him as fast as he could force him along toward the river. Naturally I was frightened, and hardly knew what to do; but instinct told me I must have my horse, and grabbing my rifle I started out toward the Indian, hollowing at the top of my voice. The pony was evidently as frightened at the Indian as I was, and was stubborn in his movements, and the Indian finally dropped him and fled across the Elkhorn.

Ten or twelve years afterwards, when I was in command of this department, and was ordered to open the different mail and stage lines across the continent, which had been closed for some months by the Indians, I raised a battalion of Pawnees to aid me as scouts, and placed in command of them Major North, a very valuable officer, and they were of great service to me. The Indian who attempted to steal my horse was one of the battalion, and stated to Major North that I made so much noise that I scared the pony and himself so that he got away from me as fast as possible and never stopped running until he reached the Pawnee village across the Platte.

On my return to the party I found it encamped on the emigrant road leading from Florence to the Elkhorn, at the crossing of the Big Papillion. During the day the Indians had been helping themselves and the party was in a far from happy state of mind—in fact, the Indians had actual possession of the camp—and you can see my introduction to Nebraska was anything but a satisfactory one.

Now, if I should try to portray to you or anyone the experiences, the trials, and the sufferings of the picket line of settlement and explorations in those days, you would declare it more fiction than fact. Early friendships made under such circumstances are calculated to last, and it is one of the great gratifications of my life that the ties that bound us together never have been sundered. I can not tell you anything of Omaha to-day, but probably no one has a better knowledge of the circumstances and facts that founded Omaha as a future great city. If you knew them all, you could see upon what slender threads at times its existence depended. Omaha, as a city, was determined long before it was settled. It came from the settlement of the location on the Missouri River of the surveys made under the direction of Henry Farnam and William Sheffield far in advance of any settlement of this territory. It fell to my lot, under the direction of that distinguished engineer and more distinguished citizen, Peter A. Dey, to make the first survey across the State of Iowa and to determine where in all probability a line would end upon the Missouri River in this parallel of latitude and where any railroad being built west would leave this river. None of you know the interests involved and the matters raised in determining that point. My survey demonstrated that the true engineering and commercial line crossing Iowa should come down the Mosquito and end at Council Bluffs, and going west the line should cross to the Platte Valley and up that to the mountains, and so on west. The financial interests in Iowa were favorable to a line running down the Pigeon and crossing to Florence; another diversion was by Bellevue, another south of the Platte, and a fourth crossing at the mouth of the Boyer, and all these lines I examined.

Before my surveys had been finally determined the parties interested had planted their stakes at Florence and announced that as the crossing place of the Missouri River. My reports were sustained by Mr. Dey, and finally the decision made was reversed and the crossing determined to be opposite this place. This being determined, I was authorized to commence work at Council Bluffs, provided I could obtain local aid, and Pottawattamie County gave me $300,000 in bonds and Mr. Farnam furnished the funds for doing the grading and what work was done up to the time that all work in the State was stopped on account of the panic. There is no doubt that the final determination of what is now known as the Rock Island Railway crossing the Missouri River was what first drew the attention of people to Omaha and that brought to the Bluffs every railroad survey at that time being made across the State, and I think there are men at this table who will say to you that that was the real first beginning of Omaha.

In 1859, if I recollect rightly, on my way from reconnoissances west with my party, which had been out the entire summer, I camped my party in Council Bluffs and went to the Pacific House. At that time Abraham Lincoln was visiting the Bluffs. He heard of my return from my surveys and sought me out at the Pacific House, and on the porch of that hotel he sat with me for two hours or more and drew out of me all the facts I had obtained in my surveys and naturally my opinion as to the route for a railroad west and as to the feasibility of building it. I thought no more of this at the time than that possibly I had been giving away secrets that belonged to my employers in this work.

In 1863, while in command of the district of Corinth, Mississippi, I received a dispatch from General Grant to proceed to Washington and report to the President. No explanation coming with dispatch, I was a little alarmed, for there had come to me at Corinth a great many negroes and I had placed them in what was known as a contraband camp and had placed over them certain soldiers as guards. This caused me a good deal of annoyance and trouble. The white soldiers did not like the duty and took every opportunity to annoy the negroes, even in some cases going as far as to shoot them. The superintendent of the camp was Chaplain Alexander, of an Ohio regiment, a very able and excellent man, and he suggested one day to me that he believed that negroes would be better to guard the contraband camp than white soldiers. I authorized him to raise one or two companies and I armed them, solely for the purpose of guarding these negroes. I had no authority to do this and I did not at the time appreciate the importance that was to be given to it. There were many protests against this, and in the command there was considerable opposition to it, and I thought that my call to Washington was possibly to be called to account for this act.

When I reached Washington and reported to the President I soon ascertained that I was there for a consultation in regard to the eastern terminus of the Union Pacific Railway. He had remembered his conversation with me on the Pacific House porch, and under the law it had been made his duty to determine the eastern terminus of the Union Pacific road, and those of you who remember that time know what pressure was brought to bear on the President to name different points far north and far south of this. After a long conversation with me, obtaining my views fully and the reasons for them, the President finally determined to make it, as you all know, on the western border of Iowa, opposite this city. That decision, in my opinion, settled beyond all question the future of your city and your State.

I wish to say here that while my surveys and my conclusions may have been of great benefit to you, still they were made because there was no question, from an engineering point of view, where the line crossing Iowa and going west from this river, should cross the Missouri River, and it was also my conclusion that it was the commercial line. The Lord had so constructed the country that any engineer who failed to take advantage of the great open road from here west to Salt Lake would not have been fit to belong to the profession; 600 miles of it up a single valley without a grade to exceed 15 feet; the natural pass over the Rocky Mountains, the lowest in all the range, and the divide of the continent, instead of being a mountain summit, has a basin 500 feet below the general level. It was a gratification to me at the time to have the support of all the people in the vicinity of this country in my views. There is no telling how much influence it had and weight it carried, and without being invidious or partial, I really think that Omaha and Nebraska to-day owe more to my old friend and always faithful comrade and supporter, Dr. George L. Miller, for the success of these efforts, than any other man. I could show you many of the benefits he brought to you, even more than he knows himself, and he was the most unselfish and determined continuous fighter for his city and State that I ever knew, and I take pleasure here in his own home in paying my tribute to him.

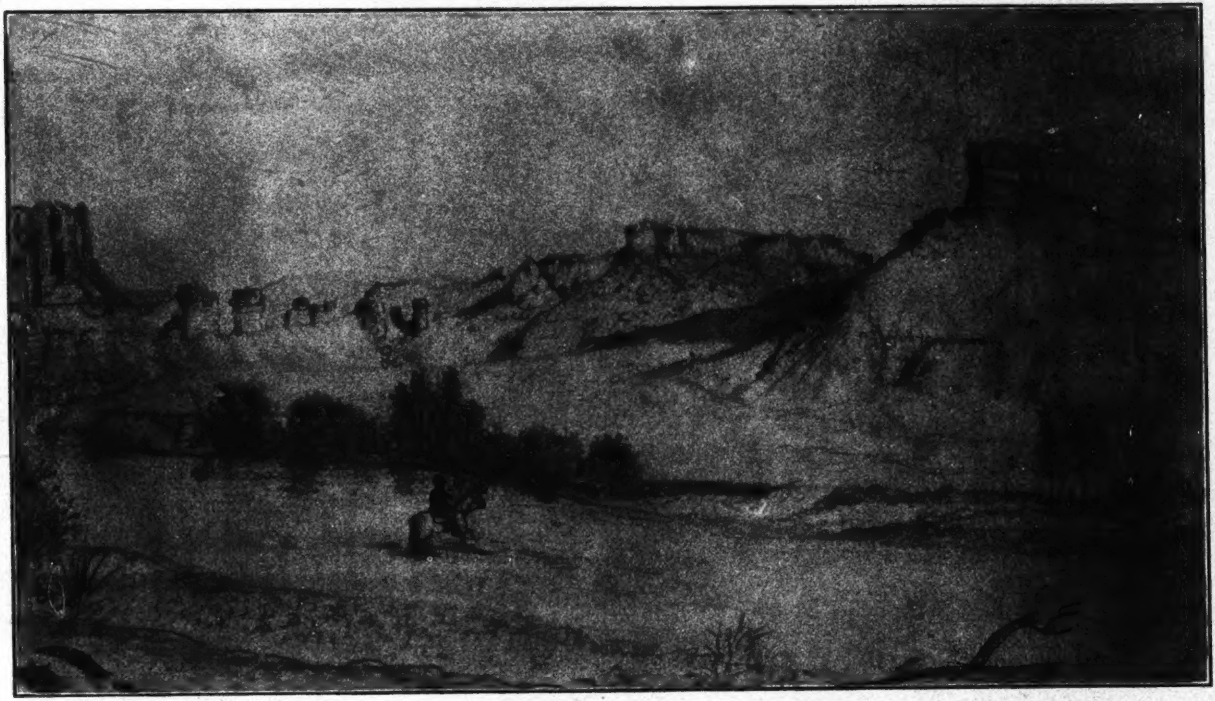
Now, gentlemen, this city and State for their great prosperity, after the fact, are mostly indebted to the Union Pacific Railway. It blazed the way across the continent. They took all the chances and solved the problem of the building of a railroad to the Pacific, not only from an engineering point of view, but also from a commercial one, and it was, therefore, easy after that for all roads to follow. It was at that time a very great problem if a road built could ever earn its interest. After its completion the board of directors of the company requested me to make an estimate of the gross earnings per mile for the next ten years. They desired an estimate from which they could prove to the people that it would be able to pay the interest upon the first mortgage bonds, and after calling to my aid all the people who had knowledge of the capabilities of the country west of the Missouri River, as well as those of China and Japan, and, in fact, of all Asia, the best I could do was to report to them gross earnings within ten years of $5,000 per mile; and if I remember rightly, in less than five years the road earned $10,000 per mile. So you see how little those who had the best knowledge of this country appreciated what its development would bring about.

The earnings of the Union Pacific made it safe for any other road to enter the territory, and to the Farnams, the Ameses, the Dillons, Goulds, Scott, Huntington, and Stanford in an early day, and to Perkins, Miller, Cable, Hewitt, and many others of a later day, this country should give great honor and no abuse. It has been the fashion in our day to hold up to the coming generation the names of Astor, Vanderbilt, and the noted Knickerbockers as the great men, commercially, for them to follow. These men invested their money in the East, where it was safe and sure of dividends, but the men who developed the country and brought in their millions without one cent in return, they are the ones you and all others are indebted to for their foresight, their risking everything, and finally building up a great empire west of the Lakes. Most of those of the earlier day have passed away, and this country is now awakening to the credit due them, which I hope will some time be paid them.

When you come down to the present time, I admit that I am not up to the times. I never dreamed that the Union Pacific Railroad would control the Southern Pacific. My fear was always that the ownership would be in the Southern Pacific. You must not sit still and pass by what there is for you here in this great control. Your business men must get near to the throne, and use your energies like Miller and Hitchcock, and Saunders and Millard, and many others did in an earlier day, to take the benefits of these new developments. Nor need you be afraid of the great combinations just completed in the Northwest. It will not raise the rates of freight one mill nor of passengers one cent. The men at the head of that gigantic enterprise are broad minded. They have thought and built well, and they will bring stability, development, and great wealth that can not but be of great benefit to you. You must not forget one of the great advantages of such combinations to a new country. They have behind them such an immense capital that when you go to them with any project that has merit in it for the development of your country, they are able to adopt it and carry it out, whilst in an earlier day projects were often presented to those who controlled the internal improvements of this country which they saw the merits of and were anxious to take hold of, but it was impossible for them to obtain the capital at those times to do it. Nor must you forget what this combination means. The country west of here has hardly been scratched, and with the brains and capital of the country pushing forward its development with steam and electricity and air, what one here can prophesy what fifty years will develop between here and the Pacific Ocean?

I know there is some nervousness among people about these great combinations, but those that are not upon a solid basis will topple over from their overweight, and the others will continue and grow and bring stability to all kinds of business. The commercial man wants to know that he can safely lay down plans for six months or a year, and under such direction he can safely do it, and it is a mistake to attack them before you are hurt. You will find greater benefits coming to your country by supporting and aiding them rather than by abuse and opposition.

New blood must take the place of old, and I bid you godspeed in your efforts. And now, my friends, in our old age the great satisfaction to all of you and to me is to know that our early efforts are both recognized and appreciated; that the old friendships acquired in trials and tribulations are still fresh and true; and to my old friends, and all of you I wish I knew how to express to you what is in my heart, but I can not. I can only say, I thank you with all my heart.



UNION PACIFIC RAILWAY CROSSING, GREEN RIVER, UTAH.

LETTER TO THE IOWA RAILWAY CLUB, DES MOINES, IOWA, MAY 25, 1908.

Mr. C. W. Jones,
President Iowa Railway Club, Des Moines, Iowa.

Dear Sir: It is with deepest regret that I find myself unable on account of an illness, not serious, but which makes it impossible for me to travel, to be present at the reunion of the old-time railway men of Iowa, for it was my good fortune early in 1853 to cross the Mississippi River and be one of a party under Mr. Peter A. Dey, one of the most distinguished railroad engineers and citizens, that made the first survey across the State of Iowa from the Mississippi River at Davenport to Council Bluffs on the Missouri River, and to take part in the building of that line to Iowa City. I think it was the first railroad built in the State of Iowa. I take great pleasure and great satisfaction in extending my greetings to my railroad comrades of that day.

It has also been my good fortune to have continued my railroad work from that day to this, even including the civil war, for in my duties there I had to destroy and rebuild many miles of road, so I can claim not only to have been in the beginning, but a veteran in the service, and in all these years I have seen the work of you men that has developed and brought such prosperity to this country.

The men of the early day who risked their fortunes and their credit to develop this great country are not only entitled to our thanks, but monuments should be raised to the work which they accomplished, for most of them waited many, many years before they received any returns from the vast investments which they made. The railroads of this country were most of them built far ahead of the population's demand and were the pioneers in the development and settlement of the country. These men have never received the credit that is due them, but some day when the history of the railroads of the United States is written the risk they took, the work they accomplished, will equal that of any other performance in our or any other country. To you who were in the beginning it is not necessary to relate the exposure, hardship, and privations that railroad men of our class had to contend with and how different our work in those days was compared with what it is under the present modern conditions. Still I claim we performed our work as efficiently with an interest in it and esprit de corps that was equal comparatively with the work of our railroad comrades of to-day.

We have seen the railroads of a few thousand miles of that day grow until in the United States we have nearly, if not quite, 240,000 miles, and in our State we have seen built a network of them that I believe covers every county in the State, probably giving our State as good, if not better, transportation services than that of any other State in our Union, although we are simply an agricultural State and it is this fact that has made our State so prominent a factor in all matters of national importance, and that has given it such universal and individual prosperity.

The railroad problem of to-day is a far different one from what it was in your day. Then the whole aim and effort of the country was to obtain the building of railroads. Great bonuses in stock were given to capital that would invest in them; it was the only method of obtaining the construction of roads; even those that had land grants in our day, which now are considered of such great worth, added very little in the negotiations of the securities that built the road.

The growth of the country, its business, its population has brought about an entirely different state of affairs. Legislation of to-day for the police and control of railroads all tends to prevent the building of new roads and to enhance the value of old ones, so that now the transportation of the country is organized in great systems instead of as in an early day where every road was running in its own interest and independent of every one of its connections. It is a singular fact in this modern legislation that the people best equipped for forming it and carrying it out have been very little considered. Therefore much of it is impracticable and has been found by the courts impossible. That of it which has been put in force has been acquiesced in by the railroads and they are working now with the Interstate Commerce and state commissions in harmony and endeavoring to comply with the laws and decisions, not only in the letter but in the spirit, and, as our people get experience in these matters, I have no doubt, myself, that the legislation will be made practical and of benefit to the roads and to the people.

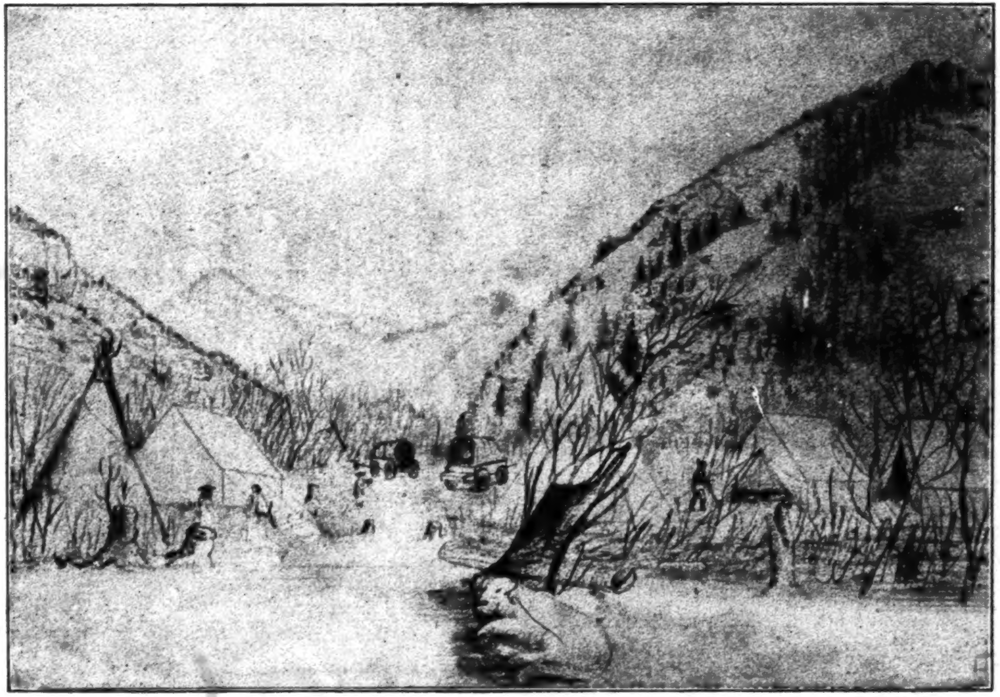
Experience shows the people as they investigate this matter that the railroad problem is a very hard one to solve and that it takes long experience to frame laws that will accomplish the objects they have in view. One of the most mistaken ideas that our country has in relation to the railroads of this country is the statement often made by officials and through the press that the railroads of this country are overcapitalized, that their stock is mostly water. People forget that since the roads were first built that out of their earnings millions upon millions of dollars have gone in for their improvement and betterment, for building up their great commercial business, and that their value has increased with that of other products and industries of our country. They forget that the life of the railroad now is only about twelve years and that it has to be rebuilt, so that during our time most of the roads of the United States have been rebuilt three times and the rebuilding of them has one-half of it come out of its earnings and all this has been added to its capital without the issue of bonds or stock.

When you go back to our day and remember that our rails were iron and only about 40 or 50 pounds to the yard in weight, our cars were of 20 tons, our locomotives of 30 tons, and that now our rails are steel and run from 75 to 105 pounds to the yard, our cars from 40 to 60 tons, our locomotives 60 to 100 tons on the drivers, and that most of our roads in their bridges, in their shops, and all of its improvements have had to be reconstructed in the same way and are only to-day being made permanent; when you consider that in an early day the question of terminals was never a factor, while to-day the terminals of some roads passing through some cities cost more than the road itself; when you see such roads as the Pennsylvania spending $100,000,000 to get its passenger trains only into New York City, and the New York Central spending an equal amount to enlarge its passenger facilities in New York; when you see such great systems in the West as the Union Pacific and the Southern Pacific having spent in the last five years over $200,000,000 to reduce their curvatures and grades, and see the immense sums that have to be spent all over the United States to develop the capacity of the properties, you can then begin to comprehend the fact, which statisticians who have examined the question thoroughly say, that the railroads of the United States to-day are not overcapitalized. In other words, there has been more actual money put into them than their stock and the bonds represent. This has been attested to by the President of the United States, who probably has given it closer attention than anyone else outside of the railroads, and by the Interstate Commerce Commission, who have also given it great study, and they have both given the opinion that the roads to-day of the United States are not overcapitalized, and that fact is becoming patent to the people of the United States, for the great increase in stockholders in the roads of the United States to-day shows that instead of these properties being in the hands of a few wealthy men, as is often asserted, they are owned most in this country by a vast number of stockholders, which is increasing daily.

It is the duty of us who have been long connected with the roads, or who were connected with them in an early day, to do what we can to educate the people of the United States as to the real facts in connection with railroading. In my opinion where the railroad people have been lacking in their duties is in not educating the people as the years went by, and setting forth more clearly to them the railroad interests and their intentions. The fact is that every railroad man has been so busy looking after the proper administration of his property that he has very seldom or ever gone into a defense or explanation of his work. As a proof of this, I have been a railroad man continuously since I was 19 years old and this is the first letter that I have ever written that in any way went to a defense of the railroads of the country. I have been in favor from the beginning, with a great many other railroad men of the country who were among the first to bring the necessity to the Government's attention, of proper legislation for bringing about uniformity, in all service, reasonable and fixed rates without rebates, with proper control of the railroads of the United States. The necessity for this has only come in the last few years, and it is recognized now almost universally by railroad men, and your association can do a great deal to continue it in a sensible and profitable way, and I trust at this meeting a permanent organization of the railroad men will be formed for this State.

Every one of you should be proud of the fact that you have been a part of and did your duty in the great railroad field that numbers many of our ablest men and officials of our country, that you have been a part of that great system which employs over 1,500,000 of our population, and as one of you, the highest compliment that can be paid me when I am gone is that I was over fifty years one of the railroad fraternity of the United States and did my duty to the best of my ability.

It is a great disappointment to me that I can not be present with you, to first grasp by the hand my old chief, Peter A. Dey, whom I hold to be one of the ablest of the railroad men of our country, one of the squarest, fairest, and most just of all the men I ever met, and the two Houses, J. E. and George, who were in our little party that crossed the Mississippi River in 1853.



GENERAL DODGE'S CAMP, BLACKFOOT CREEK, UTAH, 1867.

DESCRIPTION OF NORWICH UNIVERSITY.

Given at the Annual Banquet, April 3, 1893.

We have with us this evening, besides those directly connected with Norwich University, representatives of West Point, Yale, Harvard, Dartmouth, Hamilton, and the University of Vermont, as well as a delegation from the Brooklyn Society of Vermonters. Many of them probably do not know much about Norwich University, and for their information I have compiled from the records a short statement which I will read.

Norwich University was founded by Capt. Alden Partridge in 1819. Captain Partridge had been the commandant of West Point and left there to found a literary, scientific, and military academy at Norwich, Vt., and there started the first scientific, classical, and military college in the United States. It was the first institution to lay down a thoroughly scientific course of study, and up to the time of the rebellion it was the only one which embraced a thorough military, classical, and scientific course. Its second commander was Col. Truman B. Ransom, who left to take command of the Ninth New England Regiment in the war with Mexico, and who was killed while leading his regiment in the assault upon Chapultepec, Mexico, his last words being, "Forward, the Ninth!" The university has never had one cent of endowment. It has been always poor, struggling for existence, and its cadets were mostly poor boys, working their way through college by their own efforts. In the war of the rebellion its record, according to its numbers, is far beyond any civil institution of learning in the country. In 1864 its roster, as partially completed, showed then in the service, 12 generals, 25 colonels, 40 field officers, 50 captains, 142 lieutenants on the Union side. There were a great many on the Confederate side, but no roster of them has ever been made.

Its roll of honor includes Harney, Buell, T. E. G. Ransom, Terry, Seymour, Strong, Milroy, Louden, Seth Williams, Wright, Baxter of the Medical Department, Dewey, Abbott, Converse, Colvocoresses and others of the navy, and many other equally good soldiers and sailors.

General Grant often paid high tribute to Norwich University, and in his promotion and commendation of its cadets gave them the highest command and great honor, placing one of them, a brigadier-general, at the head of a corps, where he remained until he was promoted to major-general, while major-generals in the same army were commanding divisions.

General Sherman never failed, when Norwich University was spoken of, to commend it, and he paid it the highest honors by giving to two of its graduates (I think then the youngest two generals of their rank in his army) the command of corps, one of whom, Ransom (son of Col. Truman B. Ransom, who was killed at the assault upon Chapultepec), died while leading the Seventeenth Army Corps in the chase after Hood.

In speaking of this institution publicly at one time, while paying tribute to one of its cadets, General Sherman spoke as follows:

> Norwich University, then, as since, a college of great renown. This military school at one time almost rivaled the National Military Academy at West Point, and there many a man who afterwards became famous in the Mexican war and civil war first drank in the inspiration of patriotism and learned the lessons of the art of war, which enabled him, out of unorganized masses of men, to make compact companies, regiments, and brigades of soldiers, to act as a single body in the great game of war. I have been at Norwich, which is situated on the western bank of the beautiful Connecticut River, directly opposite the venerable University of Dartmouth, and believe that such picturesque surroundings make an impression on the mind which purifies and imbues it with an exalted love of nature and one's country.

Since that time Norwich University has removed to Northfield, Vt.

Norwich University is to-day more prosperous than ever before. The State of Vermont has given it official recognition, and I believe that each state senator of their legislature is entitled to appoint one cadet to the university, and that the State pays for his tuition.

There are a few of us who meet here now yearly to keep alive the spirit and principles of the college, holding closely to its military department. It has stood first in work of all the military colleges of our country and ranks next to West Point in the graduates it turns out and in the service given in the civil war.

BEAR RIVER BRIDGE, UTAH.

NORWICH UNIVERSITY IN THE CIVIL WAR.

Given at the Annual Banquet in New York in 1902.

I take great pleasure in welcoming you to the banquet of the New York Association of Norwich University. The distinguishing feature of this university is that nine-tenths of its students are dependent upon their own efforts, not only for their education, but their future in the world, and there is no doubt that from this fact so many of its cadets have been successful in all the walks of life. It is a military college. Its first president was the first commandant of West Point, and from its organization until to-day it has stood first in the records of the War Department as compared with other institutions of a similar character, and second only to West Point.

In the Mexican war its president, Truman R. Ransom, and most of the cadets entered the service of the United States. Ransom was colonel of the New England regiment, and fell in the assault upon Chapultepec.

In the civil war 90 per cent of its living cadets entered the service, mostly as officers, on one side or the other, and, as the history of the university shows, many of them rose to the highest rank and highest commands in the service. The university received the commendations of Generals Grant, Sherman, Sheridan, Thomas, and others, and Norwich University cadets were always selected next to those from West Point, for important and difficult demands. There are present here to-night those who were cadets during the civil war whose whole class enlisted. In fact, the whole university turned out, suspending the functions of the institution for two years.

In the Spanish war it is said that 85 per cent of its living cadets volunteered for service, and were distinguished on many fields. Many of them are still in the service. It was equally as well represented in our navy in both wars. It was one of its cadets that struck the first effective blow in the Spanish war, and another cadet, Commander Colvocoresses, who commanded one of the vessels, after the naval battle at Manila, went alongside the *Olympia* to pay his respects and congratulate Admiral Dewey upon his great victory. Admiral Dewey, who saw Colvocoresses as he came alongside in his launch, leaned over the rail and said, "Colv., old N. U. is ahead yet," showing no matter what his after life or education had been he gave the credit for his success to his alma mater.

In civil life its cadets have greatly distinguished themselves as engineers, and in other professional lines. Probably I can say that there is no one who has had as many of the cadets of Norwich University under him as I have, both in the civil war, and later in the internal improvements of the country, and to my knowledge there has been no failure among them. They have universally taken their places and held them until they went to higher positions. The university to-day is the military college of the State of Vermont, which assigns to it a representative cadet for each senatorial district.

I believe myself there is no education so beneficial to a young man as that which gives discipline, respect for power, and obedience to orders, and the drill and exercise add to the health of the student, so when he steps out into the world to fight his way he is better equipped than those who have gone through college without this physical and mental training.

I am happy to say that the university has never been so prosperous as it is to-day. The interest in it is growing, and it is a great satisfaction to the old cadets to see and feel the high esteem in which it is held throughout the country. In comparison with other colleges few in numbers, but in acts and all things that go to make and defend a great country we stand the peer of the best institutions of learning our country has produced.

It is a great pleasure for me to welcome the large attendance at this, our annual banquet, and to congratulate you upon the prosperity of old N. U., and also upon the presence of so many distinguished officers of the army, which indicates better than anything else the interest taken in the growth of the military colleges of the country by the War Department and Regular Army, and the appreciation of their usefulness in the building up of a great national reserve, such as other countries have, that can be placed in the field ready for service in a short time. Secretary Root was the first to fully recognize the advantage to the army of utilizing their work, and since his time Major-General Bell has carried out and developed his plans, and a late order of his has gone forth in advance of Secretary Root, as it places our honor graduates in the army without mental examination.

I saw not long ago a criticism from some officers of the General Staff that graduates of military colleges did not show a disposition to enter the army in times of war, and citing the Spanish war as an example, there being but few officers in the volunteers coming from the military colleges and schools. I think their conclusion does not show a very deep study of the organization of our volunteer force in the Spanish war, or such a statement would not have been made.

There is present here to-night a former distinguished officer of the Regular Army who had charge of the organization of the volunteer force in the Spanish war who can bear me out in the statement that the policy adopted by the Government at the instigation of the governors of the different States was to place in the service intact the national guard of these States, and the volunteer forces of the war were organized on that plan. As I recollect, the regiments mustered into the service took about 90 per cent of their officers and only 40 per cent of their enlisted men. When it came to the enlistments for the Philippines, the War Department took that directly under its own charge, and selected the officers of the regiments, and naturally and justly gave preference to officers and enlisted men who had shown fitness and ability in the service in Cuba, and selected them as officers in these Philippine regiments. This almost excluded officers outside of the national guard on account of the limited number organized and mustered in. I think it would have been much fairer to the military colleges to have gone back to the methods of the civil war where nearly all enlistments were voluntary, and officered by the governor of each State. At that time there was in the North but one military college that I know of, and that was Norwich University. In the South there were several. One that I know of was in northern Alabama, in the Tennessee Valley. I saw it burned down by my troops in the campaign up the Tennessee to the rear of Bragg for the purpose of destroying the stores accumulated by him along the Memphis and Charleston Railroad. A company of the Seventh Kansas Cavalry struck the military institute, and considering that it came within my orders for the destruction of material and supplies that could be used by the enemy, burned it and reported it officially to me. As I said, I saw it burn, and regretted it, as it was contrary to my orders. However, since the war I have tried to aid its trustees in establishing their claim for payment by the Government on account of its destruction. There was another military institution in Virginia, and I think in one or two other Southern States, though I am not certain. But take the record of Norwich University, with which we are acquainted. The president had just compiled from our records a roster of its cadets who served in the Mexican and civil war, and here it is; I will read it:

Major-generals	8
Brevet major-generals	2
Other general officers	11
Brevet brigadier-generals	18
Colonels	43
Lieutenant-colonels	29
Majors	37

Captains	144
First lieutenants	72
Second lieutenants	42
Surgeons	23
Foreign service	63
Privates	60
Admirals	1
Rear admirals	5
Commodores	7
Captains	5
Commanders	3
Lieutenants	11
Ensigns	1
Engineers	3
Midshipmen	14
Chaplains	1
Drill masters—rank not known	3
Warrant officers and miscellaneous	8
Commissioned officers with war service	485
Total with war service	584
Total with militia service only	143
All with military or naval service	717

The enrollment at Norwich University for the thirty years from 1835 to 1864 was 956, and 427 of these served in the civil war as officers, or 46 per cent of the total enrollment. Of course, many of those enrolled during the thirty years had died, so the percentage should really be much larger.

The enrollment at the Virginia Military Institute for same period was 1,430. Nine hundred and eight-six of its cadets served in the civil war, of which 563 were commissioned officers, or 68 per cent. I have no doubt in case of war and the opportunity was offered, the military colleges would furnish as large a percentage as they did in the civil war.

The attendance at Norwich University up to the time of the civil was was seldom more than 50, and I think it is fair to state that no institution of learning ever turned out such a proportion of its students to serve its country, and none other can show the distinction they attained in the service. Although I do not state it as a fact, I believe it compares favorably with West Point. If you go into civil life, into the scientific professions, you will find that the graduates of the military colleges, in proportion to their numbers, hold the most important positions and have accomplished the most important work. If you go into the development of the country and its internal improvements you will find these graduates very prominent. In the civil war General Grant and General Sherman paid their tribute to them, not only in words but in deeds. When it came to the selection of officers for important commands, especially independent commands, they took first the graduates of West Point, next the graduates of these colleges. No matter what you read or hear, in the army and navy, as in all professions and industries, the educated soldier must come to the front first. The rest have to learn from years of experience what they know from the beginning, and for that reason in building up a great national reserve for our country (which we are bound to have) each year our military schools will become a great and prominent factor, and will be more and more utilized by the Government.

I am opposed to war, and will go as far as any man to prevent it, but am a firm believer that peace can only be preserved by having an army and navy, and a reserve that can be put into the field ready to meet any force it is possible for any country to bring against us. This will insure peace, and I hope ere long a permanent agreement will be made by all nations to arbitrate and carry out the plans of our Government which were so forcibly and ably presented at The Hague conference.

As to the standing of these military colleges, I call your attention to the reports of inspection made by the War Department in 1903 on Norwich University. They are too long to read, but nearly all the questions asked by the War Department and General Staff are answered favorably, and the final statement for 1907 is as follows:

> The general excellent condition of the military department of this university reported last year has been maintained. The work here is very satisfactory, and the college authorities deserve all possible encouragement and assistance from the War Department in their efforts to maintain their high military standing. Lieutenant Chapman's selection for this duty was a very fortunate one.
>
> MICHAEL J. LENIHAN,
> *Captain General Staff, Inspector.*

It is a singular fact that the charitable people who give large sums for the maintenance and endowment of colleges and schools of the country, seldom, if ever, give to the military college, so that young boys who enter these schools go there from an instinct or love of the military feature of them, and are therefore of necessity bound to make good soldiers and good officers. Most of those who go to these colleges have to work their way through, and seek employment on their merits alone, and are taught lessons they never forget. I have in view an object lesson of this kind which occurred on one of our roads during this last fall. Our trainmen struck at noon one day without any warning to us, and left their trains standing. When our employees learned this, under the lead of a graduate of Norwich University who is an employee of the road, they volunteered to man the trains and run them for us. I think we were not obliged to bring in any additional men, and in about two weeks the strikers, seeing the spirit and esprit de corps in the employees of the company, returned to their work without obtaining any of the demands they had made. It is the education received in these colleges that brings about an interest in their employer's work. Its graduates are fitted for any position in life. First, because of the training which gives them strength and health, and second, because daily they are taught honesty and industry, respect to authority, loyalty to the Government, and finally absolute obedience to orders.

COTTONWOOD GROVE, WEBER CANYON, UTAH.

ADDRESS ON NORWICH UNIVERSITY, 1903.

Before the Vermont Society of New York.

For your kindly greeting, and the honor you have conferred upon me by electing me an honorary member of your society, you have my grateful thanks.

When a young boy I spent four years among the green hills, beautiful valleys, and sweet, honest, hearty homes of Vermont. I thought then they were years of hard toil, of vexations, and of submission to older boys who wore brass buttons and sat down upon me severely, and I longed to see them over; but from that day to this they were my happiest hours, free from care and responsibility, and for the benefit I received and the lessons they taught me, for the dicipline in mind, thought, and action, and the respect to authority that was drilled into me, I am here to-night not only to thank the State of Vermont, but to say a few words for the institution that sent me forth so well equipped to meet the world.

The Green Mountain Boys have not only always faced the enemy, but have made a record on the battlefield second to no other State. Vermont's killed and wounded in battle, the success of her troops, and the ability with which they were commanded in each engagement is known to you all. She stands, if I remember rightly, second on the roster, not only in killed and wounded in a regiment, but in the largest percentage of the killed and wounded, according to the number of troops furnished by each State.

Among the leading officers of the army the question has often been discussed why this was so. I think it was that her troops were so well commanded. This came from the fact that for forty-two years before the war of the rebellion she had a standing object lesson in the necessity and benefits of a military education before her youth in Norwich University.

The history of that university and its record in war and peace will demonstrate to you one of the principal reasons that has placed our little State of Vermont so high on the roll of honor of this nation, and when I recite it to you I know it will receive at your hands the credit due to it from the sons of Vermont.

Capt. Alden Partridge, the commandant of West Point, left there in 1819, to found a literary, scientific, and military academy at Norwich, Vt., and there started the first private scientific, classical, and military college in the United States.

It was incorporated as Norwich University in 1834, and was modeled after West Point. It was the first institution to lay down a thoroughly scientific course of study, and, up to the time of the rebellion, it was the only one which embraced a thoroughly military, classical, and scientific course.

From the time of its foundation until to-day, in its military and scientific features, it has stood second to our national academy. It is by its charter nonsectarian. The discipline, distinction, and duties of an officer and a soldier are maintained throughout its course.

The university is maintained on less than $5,000 a year. It has never had one cent endowment. It has always been poor, struggling for existence, and its cadets were mostly poor boys working their way through college by their own efforts. The expense of a cadet, including everything, is not necessarily over $200 a year, and of cadets appointed by the State, not over $150; this alone teaches economy, industry, and self-reliance.

The cadets wear a uniform patterned after West Point, thus avoiding extravagance in dress. Their military duties and studies take every hour in the day from 6 a. m. to 9 p. m., preventing idleness and negligence. The drill and exercise make hearty, healthy men, who often march 30 to 40 miles per day carrying the equipment of a soldier.

In the war of the rebellion its record is far beyond any civil institution of learning in the country. In 1864 its roster, as partially completed, showed then in the service 12 generals, 25 colonels, 40 field officers, 55 captains, 142 lieutenants, and many noncommissioned officers and privates on the Union side.

There were a great many on the Confederate side, but no roster of them has ever been made. During the war of the rebellion the undergraduates enlisted so fast that for two years there was no commencement at the university. The second commander of the university was Col. Truman B. Ransom, who resigned to take command of the Ninth New England Regiment in the war with Mexico, and who was killed while leading his regiment in the assault upon Chapultepec, Mexico, his last words being, "Forward, the Ninth!"

The roll of honor includes Harney Buel, the three Ransoms, Seymour, Strong, Milroy, Louden, Seth Williams, Bryant, Wright, Baxter of the medical department, Abbott, Converse and others of the navy, and many other equally good soldiers and sailors.

General Grant often paid high tribute to Norwich University, and in his promotion and commendation of its cadets, gave them the highest command and great honor, placing one of them, a brigadier-general, at the head of a corps, where he remained until he was promoted to major-general, while major-generals in the same army were commanding divisions.

General Sherman never failed, when Norwich University was spoken of, to commend it, and he paid it the highest honors by giving two of its graduates (I think then the two youngest generals of their rank in the army) the command of corps, one of whom, Ransom (son of Truman B. Ransom, who was killed at the assault upon Chapultepec), died while leading the Seventh Army Corps in the chase after Hood.

In speaking of this institution publicly at one time, while paying a tribute to one of its cadets, General Sherman spoke as follows:

> Norwich University, then as since, a college of great renown. This military school at one time almost rivaled the National Military Academy at West Point, and there many a man who afterwards became famous in the Mexican war and civil war first drank in the inspiration of patriotism and learned the lesson of the art of war, which enabled him, out of unorganized masses of men, to make compact companies, regiments, and brigades of soldiers to act as a single body in the great game of war.
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> I have been at Norwich, which is situated on the western bank of the beautiful Connecticut River, directly opposite the venerable University of Dartmouth, and believe that such picturesque surroundings make an impression on the mind which purifies and imbues it with an exalted love of nature and one's country.

Next to its military renown, its cadets have won great distinction as leaders in the development of this continent; they explored for our great railways not only in our own country, but in others, especially in South America; they connected the Atlantic with the Pacific with that great continental system first built, which has added so much to our civilization, wealth, and progress. Their aid and advice have been sought in most of the great works of Europe and China; as civil and mining engineers they have gone over, through and deep down in all of our great mountain ranges—the Andes and the Alps. One of its cadets, Professor Jackman, whose mathematical mind has won him great renown, in 1846 conceived and published the plan of an ocean magnetic telegraph cable, remarkably like that laid in 1858. It is believed by many that Cyrus W. Field received his first idea of the ocean cable from Professor Jackman's publications.

In 1884 the State of Vermont enacted a law, giving each state senator the right to appoint a cadet from his district to Norwich University, and appropriated $50 per year for his tuition and room rent.

This state recognition made it a state military university; added greatly to its standing and the "esprit de corps" of its cadets.

Col. R. P. Hughes, Inspector-General of the United States Army, in his official report to the Secretary of War, says:

> The military department has been a marked feature of this institution ever since its establishment in 1819 by Capt. Alden Partridge, of the Corps of Engineers; the military system has been carried into the entire duty of this college, and the company officers have charge of their subordinates in the dormitories as well as on the parade ground. The officers who are members of the senior class have a control and influence over the lower classes that make itself felt in the management of the establishment.
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> The military department can have no higher encomium than that supplied by its own record in the war. I know of no other institution in our country that can present such a striking and practical example of the spirit of loyalty and patriotism instilled into its students. This institution is sending out each year a class of men who are well fitted, both practically and theoretically, to assume command of battalions should any necessity arise for such services. Although the numbers are small, it is due the institution to say that in its military system, discipline, and instruction it stands at the head of all the colleges in this inspection.

Lieutenant Kimball, the officer detailed by the Secretary of War for duty at the university, and its commandant, in his report for 1893, says:

> The year's work included a thorough course of drills in all arms of the service. The cadets were in camp during June, with three drills a day. During this time only one cadet was under arrest. Fifty-five recitations in military duty and science were had. The cadets lived according to the customs of our military services, and it established between their officers and privates habits of respect and official courtesy which they carry into their future lives.

The successfully maintaining of such institutions grows more difficult each year. The natural tendency of young men, especially those with ample means, is to the larger colleges, but if they would stop and think a moment, or could have the experience of graduates in after life, they would learn that for their own benefit smaller colleges, more remote from large cities, from their temptations, are the best. In large colleges the student's identity is absolutely lost. They spend four years without individuality, and generally without ambition, but in smaller institutions of learning they are measured, tested individually; competition gives them favorable recognition by the faculty; lifts the student to a higher plane and greater efforts, and when he graduates he carries with him a personal acquaintance with the entire corps—his record, individually, and success come to him every year in his life.

Last June I attended the commencement of Norwich University, at Northfield, Vt. The governor and his staff, in uniform, were present, the governor delivering to each cadet his diploma, and speaking appropriate words before an immense audience, making it a state occasion. It brought together delegates from different colleges, the army officers stationed in and near Vermont, and distinguished guests. They listened to the graduating class, witnessed the drills in all the arms of the service, and it was the unanimous decision of all that the soldierly bearing and discipline, the respect shown to rank and authority, and the scholarly attainments of the cadets were a great credit to the university and a great honor to the State.

I had not visited the university since I bid it good-by in 1851. I saw much to give me encouragement, notwithstanding the great difficulty under which it labors by having to earn by day labor every dollar it spends each year. It is more prosperous now than ever. In ten years it has quadrupled its attendance, has built a new hall, added materially to its scientific and engineering appliances, has paid off its mortgages, and is free from debt. Has as commandant an officer detailed by the United States, who takes great interest in its success. It needs badly a new drill hall, gymnasium, and steam heating for all its buildings, large additions to its electrical and engineering department, and more instructors. Those there now are overworked. They hardly have a moment leisure from early morning until late at night. In fact, after their duties with the cadets are over they have to attend to the correspondence and business of the university.

To obtain all this on a permanent basis the university must have a permanent income. From [illegible]dowment, scholarships, in fact, from every source that our colleges are helped, Norwich University stands alone of all the colleges in Vermont without endowment. Vermont has been fortunate lately in the large sums donated to its institutions of learning, which is rapidly building them up, and I appeal here to-night to the sons of Vermont, as you have made me one of you, to place Norwich University in a position in the State financially that it holds in the nation intellectually.

The record the university has made for her State on the battlefield, in the inaugurating, building, and managing the great enterprise of the country entitles her to your serious consideration.

If you want to do honor to your State, and credit to yourself for all time, let me say to you, it is best done by aiding old Norwich University. It is no disparagement to others to state that it has a wider reputation than any of the institutions of learning in Vermont on account of its military and scientific record, and the Sons of Vermont may rest assured that every dollar planted to its benefit now or in the future will be heard from more effectually hereafter than in the past, for there will be as great fields for her cadets in war, science, and industries, national and international developments as has occurred in the past, and what Vermonter or his descendant will not be proud of the fact that it was his aid that enabled its cadets to so distinguish themselves, that as honored a name, and as great a commander as Grant, and as great a general, strategist, and engineer as Sherman, gave great honor, and upheld and applauded before the world the deeds of the cadets of Norwich University, and gave the credit for them to the education and training they received at Norwich University?

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